



23rd Montréal Process Working Group Meeting

Adelaide – Australia, 8 to 12 July 2013

Annex F

Changes to technical notes for Criterion 4: Soil and Water and Indicator 6.1.c

AGENDA PAPER #13 FOR 23rd MPWG MEETING

TITLE: Possible changes to technical notes for Criterion 4: Soil and Water and Indicator 6.1.c

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Recommendations

It is recommended that members:

Discuss and agree recommendations for revisions to the technical notes for Criterion 4 and Indicator 6.1.c

- 1. Criterion 4 Technical Notes:** That the Working Group adopts revised technical notes associated with Criterion 4 to give greater profile to aspects of water regulation, and the issue of reporting scale and spatial components for water and soil related indicators, and also to enhance the descriptions of rationales of indicators to illustrate mechanisms of soil related functions.
- 2. Indicator 6.1.c:** That the Working Group accepts the following variations to indicator 6.1.c.: (i) that the title of indicator 6.1.c 'Revenue from forest environmental services' be modified to replace 'environmental' with 'ecosystem' and the glossary of terms updated with a current internationally recognised definition of forest ecosystem services; (ii) that the technical notes for indicator 6.1.c be updated to reflect the modification to the title; and that the full technical notes be reviewed for consistency of the term 'ecosystem'.

Background and Consideration

At the 22nd meeting of the Montréal Process Working Group held in Victoria, British Columbia, Canada in October 2011 the Montréal Process Technical Advisory Committee (TAC) was tasked to '*identify appropriate indicators and mechanisms that provide a stronger foundation for describing how sustainably managed forests conserve soil and water resources and related services and functions*' (section 10: http://www.rinya.maff.go.jp/mpci/meetings/22_e.html).

The task was considered at the 13th and 14th TAC meetings. Firstly key issues and gaps were identified and then the indicator set interrogated for its ability to provide information to support the key issues.

Important issues identified included:

- Recognition that water is a boundary crossing issue
- Multiple agencies are involved with soil and water and
- Forests operate within a wider landscape and mix of land uses
- Increasing natural and human related pressures are affecting forests
- Soil erosion, its impacts and mitigation are a very high priority topic in MP countries with steepland forests
- Public awareness of forests and their role in soil and water
- Interdependencies of issues are very important
- Forests as a supplier of ecosystem services

A key conclusion from the review was that the Montreal Process Criteria & Indicators provide a very robust framework for dealing with soil and water issues, and while some gaps were identified, only relatively minor revisions would be necessary.

These revisions would affect the technical notes in criterion 4 where soil and water is dealt with specifically. But there would be benefit from some modification to the technical notes where soil and water are covered indirectly – such as in the context of environmental or ecosystem services (6.1.c).

A paper developed by Australia with suggested changes to the technical notes was used to direct discussions at TAC 14, and this was followed up after the meeting with Australia drafting suggested revisions and this draft then had further input from Japan and New Zealand. These revisions are appended to this paper for discussion and adoption.

Revisions to Criterion 4 technical notes are straightforward. The discussions around ecosystem services and the less direct treatment of soil and water in 6.1.c are still in development. Discussions on the indicator title and technical notes led to agreement by the TAC to update 'environmental' to 'ecosystem' services to reflect changes in international terminology. However discussion on other aspects of the indicator did not reach a conclusion. The details of these discussions will be presented more fully at the meeting. There is likely to be value in continuing the discussions on how the MP C&I handles the concept of forest ecosystem services.

Attachments:

- **Revised Technical Notes (changes highlighted in green)**

REVISED CRITERION 4 TECHNICAL NOTES

CRITERION 4 – CONSERVATION AND MAINTENANCE OF SOIL AND WATER RESOURCES

Soil and water underpin forest ecosystem productivity and functions. Forest ecosystems play an important role in the regulation of surface and groundwater flow and, together with associated aquatic ecosystems and clean water, they are essential to the quality of human life.

The interactions of soil, water, climate, topography, and biological activities influence the character and health of streams and rivers flowing through and from forests. Monitoring change in the chemical, physical, and biological characteristics of soil, water and aquatic systems provides valuable information to support sustainable forest management.

Forest management activities can significantly alter forest soils, water quality and quantity, and associated aquatic habitats. Appropriate forest management can protect and conserve the soil and water values of a forest and of downstream land uses. Inappropriate management may result in soil compaction, soil erosion, loss of riparian buffering capacity, increased sediment loads in streams, degradation and destruction of riparian and aquatic habitats and altered flow regimes. The quantity of water flowing from a catchment can vary due to forest management activities in the catchment, including both forest harvesting and the establishment of new forests, depending on previous land use in that catchment. Change in water flow can lead to an increased risk of flooding or to a reduction in the quantity and flow of water in streams and affect other land use activities downstream. Both outcomes can have detrimental implications for human safety, property, and economies.

Soil and water health, quality and resources may be protected through the allocation of land for that purpose or through appropriate management regimes and best management practices.

4.1 PROTECTIVE FUNCTION

Healthy and productive forests depend on the maintenance of the soil and water resource. Forests also regulate these resources by moderating the flow of water, controlling erosion, maintaining water quality, and preventing catastrophic events such as flooding, avalanches and mudslides.

INDICATOR 4.1.a Area and percent of forest whose designation or land management focus is the protection of soil or water resources

Rationale

The area and percent of forest designated or managed primarily for the protection and regulation of soil and water reflects the importance of these resources to society, including the tradeoffs made between other uses.

Approaches to measurement

When reporting, countries may wish to categorise the areas designated or managed for soil and water protection. Categories may include important catchments or designated watersheds, areas set aside due to sensitive or erosion prone soils, stream buffers, riparian zones, steep slopes and areas prone to avalanches and mudslides.

Data may be obtained from watercourse hierarchy inventories, topographic maps, designated avalanche risk-zones and areas identified as vulnerable to erosion or other soil degradation processes. Data might be available from subnational stream and soil resource assessments and protection standards. Lands managed for multiple uses but where the primary management goal is to conserve soil and water values should also be included. Countries may wish to report separately by native forests and plantation forests or by forest type.

Useful data may be obtained from governments, universities and research organisations.

4.2 SOIL

Forest soils support forest productivity and other ecological and hydrological functions through their ability to cycle, hold and supply water and nutrients, store organic matter and provide habitats for plant roots and for a wide range of soil organisms. These soil related functions mainly occur on or near to the forest floor. A reduction or loss of the soil resource, or the inappropriate disturbance of the forest floor, may result in a decline and degradation in forest health and in the provision and regulation of other ecosystem services.

INDICATOR 4.2.a Proportion of forest management activities that meet best management practices or other relevant legislation to protect soil resources

Rationale

This indicator provides information about the extent to which soil resource protection, legislation and best management practices have been identified and integrated into forest management activities. Inappropriate activity may result in loss, compaction, contamination or degradation of soils, which in turn causes the loss of soil nutrients, forest productivity and other ecosystem services that soils provide.

Approaches to measurement

Data sources may include harvest administration data and enforcement agency records. Random sampling of forest management activities and operators may provide useful information. Statistical soil sampling of forests under active management (e.g. site preparation and harvesting, controlled burning or fire exclusion) may reveal data about soil change over time and the causes of that change.

Reporting should be expressed as the percentage of management activities, operators and forest area that conform to best management practices and legislation. Different jurisdictions within countries are likely to have different standards and approaches to measure compliance. A method of normalising regional differences may also be required.

Interpretation of this indicator may be supported by a brief summary of relevant best management practices and legislation, including efforts and measures taken to monitor compliance.

Useful data may be obtained from governments, universities, and industry and research organisations.

INDICATOR 4.2.b Area and percent of forest land with significant soil degradation

Rationale

This indicator provides information on the extent of significant soil degradation in forests likely to affect productivity, hydrology, ecosystem processes or social and cultural benefits. This indicator is primarily concerned with degradation caused directly or indirectly by human activity.

Approaches to measurement

It is recognised that most countries do not have comprehensive national reporting systems in place to monitor change in soil quality as a result of human activity. Sub-national data relating to soil degradation may be obtained by comparing undisturbed sites with sites that have a known intensity and frequency of human use. Countries may wish to report using case studies to highlight current experience of soil degradation in forests. It may also be possible to establish random national soil test plots to collect statistically relevant data.

Degradation includes the processes of soil compaction, erosion and contamination by chemicals, heavy metals and radioactive substances.

Useful data may be obtained from governments, universities, and industry and research organisations.

4.3 WATER

Water is one of the most valuable of forest ecosystem services. Forests and soils and how they are managed, influence the quantity, quality and timing of surface-water and ground-water flows. This includes changes to forest structure and species composition through planned activities including timber harvesting and planting of forests on previously non-forest land, and unplanned activities such as wild fire. Changes to water quality and flow can have a severe impact on forest resources as well as human wellbeing. In addition, associated aquatic and riparian forest habitats are some of the most biologically diverse and productive forest ecosystems.

The quality and quantity of water flowing from forested areas, including annual and longer-term patterns, are commonly regarded as key components in an indicator of the quality of forest management. Water quality and quantity is widely understood to be measures that capture many potential impacts on forest sustainability and are a good indicator of overall ecosystem health.

INDICATOR 4.3.a Proportion of forest management activities that meet best management practices, or other relevant legislation, to protect water related resources

Rationale

This indicator provides information about the extent to which water resources have been identified and safeguarded during forest management. This indicator is primarily concerned with activities that may affect riparian zones, water quality, quantity and flow rather than the designation of land for water-related conservation. The protection of the water resources and associated forest and aquatic ecosystems is vital for the human populations dependent on them.

Approaches to measurement

Management standards commonly address road design standards, watershed or catchment disturbance limits, recreational site design, in-stream management, standards to reduce the effect of land use change on water availability and livestock grazing regimes.

Reporting should be expressed as the percentage of management activities, operators and forest area that conform to best management practices and legislation. Different jurisdictions within countries are likely to have different standards and approaches to measure compliance. A method of normalising regional differences may also be required.

A low percentage of compliance or an absence of water-related best management practices and legislation indicates that management may be having, or is likely to have, serious impacts on water and aquatic resources. A high level of compliance should suggest that the effects of management practices are being considered and minimised. Activities that affect either water quantity or quality may be considered, including changes in both forest management and in land use from forest to non-forest or from non-forest to forest. Countries may wish to report separately on native forests and plantations, or by forest type.

Interpretation of this indicator may be supported by a brief summary of relevant best management practices and legislation, including efforts and measures taken to monitor compliance, and planning regulations that might influence the removal of forests or the establishment of new forest.

Useful data may be obtained from governments, universities and industry and research organisations. Countries may wish to include a description of the impact of forest cover change on water availability over time or since the last reporting period.

INDICATOR 4.3.b **Area and percent of water bodies, or stream length, in forest areas with significant change in physical, chemical or biological properties from reference conditions**

Rationale

This indicator provides information relating to water quality in forests. Significant changes in the physical, chemical or biological properties of water in forest lakes, rivers and streams may reveal the extent to which management activities or natural events are affecting water quality. Maintaining water quality is important for human use and consumption and to support healthy forest and aquatic ecosystems. Where water quality is being adversely affected by human activity, forest management practices may be adapted to protect water values.

Approaches to measurement

Water quality data may be available from national and sub-national government bodies and other sources including wildlife and fish management agencies. Other data may be obtained from monitoring stations for stream volume, flow rates and timing, historic and current water quality data for disturbed and undisturbed watersheds and the reconstruction of historic data for water storage facilities. Reporting should comment on the area and percentage of water bodies and watercourses in forests where significant change has occurred.

Water quality may be adversely affected by turbidity (cloudiness), changes in chemical composition including dissolved oxygen and nutrient enrichment, temperature, pH values and by harmful algae and other organisms. When reporting, countries may wish to categorise the agents of change in water quality and their causes. Reference conditions may be based on historic variation, baselines, targets or thresholds. Where data to support reference conditions are not available, trends may be used as a substitute.

Countries may wish to highlight specific case studies in which water quality is affected by changes in its physical, chemical and biological properties and the implications for forest management.

Useful data may be obtained from governments, universities, industry and research organisations.