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System for the Evaluation of Management of Forests

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The System for the Evaluation of the Management of Forests (SEMAFOR)

Note by the Secretariat

Summary

Criteria and indicators of sustainable forest management are meant to assess progress towards sustainable forest management, although this important function has been so far neglected – C&I have been utilized more to monitor trends in forests and forest management to provide a framework for policy development and communication. In order to address the issue of SFM assessment, the ECE/FAO Team of Specialists on Monitoring Sustainable Forest Management developed a proposal for a new tool to assess the sustainability of forest management - the System for the Evaluation of the Management of Forests (SEMAFOR). SEMAFOR is based on the pan-European set of criteria and indicators, to assess as objectively as possible progress towards sustainable forest management in European countries. The proposed approach was tested by twenty countries that participated in the pilot application of SEMAFOR.

This paper provides basic information about the project, the tool, and its implementation between 2013 and 2016, notably about the pilot application, and invites the Committee and the Commission to review progress and decide on next steps. The complete description of the process, method and results of the pilot application of SEMAFOR are available in the Geneva Timber and Forest Discussion Paper 66 "Pilot project on the System for the Evaluation of the Management of Forests", available at: http://www.unece.org/index.php?id=45451.

I. Introduction

1. The notion of "sustainable forest management"(SFM) has been at the centre of the forest policy discussion since the 1990s and is a complex concept, involving balance between the social, ecological and economic dimensions of sustainable development as well as between generations and over time. At the pan-European level, countries committed to report on the sustainability of forest management according to agreed principles and objectives, using data collected in line with the regional set of criteria and indicators[1]. However, there has been no common understanding on how to measure and monitor progress towards sustainable forest management, given its complexity, the amount and variety of data to be collected, and the different circumstances at the national level.

2. Criteria and indicators of sustainable forest management are meant to assess progress towards sustainable forest management; however, this important function has been implemented only to a limited extent – so far C&I have been utilized more to monitor trends in forests and forest management and provide a framework for policy development and communication. Two reports on the State of Europe's Forests addressed the issue of SFM assessment, as did the International Tropical Timber Organization (ITTO) and the FAO Global Forest Resources Assessments in different contexts, but with limited success. The limitations of the current reporting systems in providing a clear picture of the sustainability of forest management in countries and the region has limited the formulation of evidence-based policy. It has also limited the ability to provide the wider public with simple and clear information about the status, meaning and importance of SFM.

3. In order to address this issue, the ECE/FAO Team of Specialists (ToS) on Monitoring Sustainable Forest Management developed a proposal for a new tool to assess forest management, based on the pan-European set of criteria and indicators.

4. The tool was presented to the joint session of the Committee on Forests and the Forest Industry (Committee) and the European Forestry Commission (Commission) "Mëtsa2013", held from 9 to 13 December 2013 in Rovaniemi, Finland. At that session the Committee and the Commission decided to undertake a pilot reporting on the sustainability of forest management at the national level, in the framework of the implementation of the Integrated Programme of Work 2014-2017.

5. The pilot application of SEMAFOR was carried out on a voluntary basis in 2015/2016. The project was coordinated by the author of the tool. Twenty countries, accounting for nearly two thirds of Europe's forest area (excluding the Russian Federation), participated in the pilot study.

6. The preliminary results of the pilot application were discussed by the ECE/FAO ToS on Monitoring SFM in November 2015 in Engelberg, Switzerland. The draft report from the pilot application was presented to the thirty-eighth session of the Joint ECE/FAO Working Party on Forest Statistics, Economics and Management in March 2016, and published shortly thereafter, taking into account comments received from delegates.

7. The complete results of the pilot application were published in the ECE/FAO Geneva Timber and Forest Discussion Paper 66 "Pilot project on the System for the Evaluation of the Management of Forests (SEMAFOR)".

[1] Vienna Living Forest Summit Declaration, Fourth Ministerial Conference on the Protection of Forests in Europe, 28-30 April 2003, Vienna, Austria.

II. Principles

8. The tool reports on the sustainability of forest management at the national or subnational level. The system is not designed to assess sustainability of forest management at the forest administration/forest management unit level. It aims to answer two questions:

(a) What are the issues of concern with regard to sustainability in a given country?

(b) How are the issues of concern being addressed now?

9. The aim was to develop a tool that is balanced, credible, objective and useful to policy makers. SEMAFOR should allow the identification of issues of concern with regard to the sustainability of forest management and report national remedial action planned or taken. In this regard, one of the most important functions of the tool is to identify areas where commonly set thresholds have been exceeded, so that corrective action, inside or outside the forest sector, can be taken if necessary – for example an enhancement of a fire prevention/control system in response to the increase of the area of burnt forest.

10. The reporting system also identifies strengths and weaknesses of a given country's situation with regard to sustainable forest management, helping national policy makers to identify possible issues of concern and to compare their situation with that of other countries.

11. National and local circumstances vary widely, and there is no single ideal, universally agreed level of SFM implementation to which countries would be expected to aspire. It does not make sense to say that forest management in a given country is "very sustainable" or "more sustainable" (than elsewhere). The tool therefore focuses on indicating whether or not forest management is sustainable, by identifying issues where applied thresholds are exceeded, checking whether these are really areas of concern, and, if so, which instruments are being used to address them. If no existing or emerging issues of concern are identified, the forest management can be considered sustainable.

12. SEMAFOR covers all aspects of sustainable forest management, as articulated in the pan-European criteria (the version endorsed in the Ministerial Declaration of the Fourth Ministerial Conference on the Protection of Forests in Europe in Vienna in 2003, as data have not yet been collected for the revised set). All criteria and indicators are of the same weight and considered equally important.

III. Method

13. The tool, developed by a subgroup of the Team, is based on two major steps: (i) to use of the Pan-European indicators to assess progress towards sustainable forest management, and (ii) to interact with national experts to put the data in context. The aim is to combine objective and transparent measurement with an understanding of the national conditions and context in which data are collected.

14. After the initial analysis of the pan-European set of indicators it became evident that most of the indicators cannot be directly applied for the assessment of SFM as they are very often requiring a set of variables that characterize a thematic area covered by an indicator, whereas reporting on sustainability of forest management requires the specification of a single variable - parameter. For example, indicator 1.1 requires reporting on "Area of forest and other wooded land, classified by forest type and by availability for wood supply, and share of forest and other wooded land in total land area". Therefore, for SEMAFOR purposes, for each of the Pan-European indicators, one or more size-neutral parameter(s), such as percentages and ratios, were identified (for example, "Annual average percent change in forest area in most recent ten-year period" is one of parameters proposed for indicator 1.1), making it possible to compare countries fairly (see Annex II).

15. Not all of parameters could be used for the assessment itself: some of them still have low data quality or are hard to use for a meaningful assessment. Furthermore, many indicators only describe the basic context, arising from geography, ecology and history. For that reason all the Pan-European indicators were reviewed and related parameters were classified as follows:

(a) *Assessment parameter* (20 parameters): provides information to assess the sustainability of forest management in a country for a given Pan-European indicator. For each assessment parameter a threshold is identified. An example of this parameter is "Ratio fellings/net annual increment on forest available for wood supply, most recent ten-year period". This ratio could be affected by several external (disasters) and internal (age structure) factors and its exceedance does not automatically mean violation of SFM criteria. However, if fellings exceed increment over a long period, it could be an indication of a threat to sustainability of forest management.

(b) *Context parameter* (27 parameters): describes the situation of a country with respect to a given Pan-European indicator and provides valuable information about the forests and conditions of implementation of SFM, but cannot be used to assess the sustainability of forest management. For instance, in the case of "forest cover", should forestry in a country with 70% forest cover be considered "better" or "more sustainable" than forestry in a country with 20% forest cover? Significant reduction of forest area in either country would be a matter of concern, but the baseline status is a result of history and ecology and represents a starting point in the assessment of sustainable forest management, not an element of it. No threshold is identified for context parameters.

(c) *Background parameter* (5 parameters): cannot be used to provide a reliable description or assessment of the situation with regard to sustainable forest management. This group includes parameters with problems with data quality or methodology, preventing a meaningful use of the information available. For example, "Imbalance in age structure" reported at the national level provides a generalized picture based on a variety of local situations, species, ecological and economic conditions, which makes the interpretation of the results extremely difficult. No threshold is identified for background parameters.

16. Thresholds are only identified for the "assessment" parameters. Thresholds are the same for all countries (see Annex II) despite major differences between them. Thresholds were proposed by the ToS subgroup, for use in the SEMAFOR pilot study. They were reviewed by the ToS and made widely available before the data were collected. Countries and the expert community were given the opportunity to comment on them.

17. Thresholds help identify possible issues of concern. If an indicator exceeded the set threshold, the next step in the assessment procedure, namely a "review process with the national correspondent", has to be initiated to put the data in context and to identify any special circumstances of an exceedance.

18. When an assessment parameter exceeds the agreed threshold, the national correspondent should check the accuracy of the information. Then, if the data is considered credible and reflecting the real situation/trend, the national correspondent should provide information on the background and circumstances of an exceedance. National circumstances or data issues may mean that there is no threat to SFM, otherwise, the national correspondent is asked to report on any policy/technical actions undertaken to reverse/mitigate the negative trend. Eventually, it is the national correspondent who decides whether the exceedance of thresholds is an issue of concern or not.

19. The results therefore identify, by indicator and country, where countries have exceeded thresholds in sustainable forest management, whether or not this is an issue of concern, and if and how countries are addressing the problem. The stress on policy action to

address issues of concern makes the exercise positive and provides good opportunities for communication with stakeholders.

20. *Treatment of missing data:* Implementation of sustainable forest management is impossible without adequate information on all relevant parameters. However, when assessing the sustainability of forest management, "No data" cannot be considered as the same as "Issue of concern": the situation for that indicator could be satisfactory, even excellent, but simply not measured. Therefore, "No data" in SEMAFOR is treated separately; there is no assessment made for not reported parameters but the absence of data is noted in the reporting process. The only exception is indicator 4.8, "Threatened forest species", where lack of information is considered as a possible issue of concern.

21. *Time reference:* Whenever possible, warnings should refer to a recent period, typically the last five or ten years (depending on the type of parameter), so that trends can be identified and meaningful reassessments of sustainability of forest management carried out regularly thereon. When thresholds are exceeded, the situation identified should be assessed against its time duration: (a) a sudden change of direction, (b) the continuation of a long term trend, (c) a new development, etc.

IV. Pilot application

22. The pilot application of the method was carried out on a voluntary basis in 2015/2016.

23. Twenty countries[2] (out of the 32 invited to this exercise), accounting for nearly two thirds of Europe's forest area (excluding the Russian Federation), participated in the pilot study. Data were available for about 85% of the "assessment parameters". At the first stage of the process, 21% of the data supplied exceeded the agreed thresholds, while 79% did not. After interaction with national correspondents, in the majority of the cases where the thresholds were exceeded, there were valid reasons to believe that there were no threats to the sustainability of forest management.

24. The report from the pilot application presents the detailed results, by indicator and by country, including remarks by the correspondents on cases where the thresholds were exceeded. Overall, therefore, on the basis of the thresholds agreed for the pilot study, and taking into account the indicators and the explanations provided, there is no evidence of significant areas of concern with regard to sustainable forest management in the twenty countries that participated in the pilot study. Just under 15% of the assessment indicators were "No data", which might indicate some sustainability issues, but might also indicate challenges in technical measurement or simply low priority for monitoring.

V. Conclusions and next steps

25. The pilot application of SEMAFOR confirmed the feasibility of the collection and analysing of the "context" and "assessment" parameters, based on data already available, producing meaningful and objective results, through interaction with national correspondents. The country tables generated for the SEMAFOR pilot application provided quantified descriptions of the sustainability of forest management at the national level.

26. In addition to the main objective of the project, the pilot application of the tool provided information valuable for future work on the application of C&I and on the assessment of SFM. The report from the pilot application identifies areas for further

2 Bosnia and Herzegovina, Bulgaria, Croatia, Czech Republic, Denmark, Finland, France, Germany, Hungary, Ireland, Latvia, Lithuania, Norway, Romania, Serbia, Slovakia, Sweden, Switzerland, Ukraine, United Kingdom.

development of the tool, including the use of common vs. national thresholds, and approaches to define detailed criteria for SFM assessment and thresholds.

27. The development of SEMAFOR can also be seen as an important support to the development and improvement of sets of indicators, testing concepts and whether parameters can be assessed in a meaningful way. For instance, it may be legitimately asked whether the indicators linked to "background" parameters – i.e. not measurable in practical terms - should be retained.

28. The need for methods and tools for the assessment of the sustainability of forest management was articulated at different levels of work on international forest reporting. For example, reporting on the sustainability of forest management is required by Sustainable Development Goal 15 (Protect, restore and promote sustainable use of terrestrial ecosystems, sustainably manage forests, combat desertification, and halt and reverse land degradation and halt biodiversity loss) under Target 15.2 (By 2020, promote the implementation of sustainable management of all types of forests, halt deforestation, restore degraded forests and substantially increase afforestation and reforestation globally) and Indicator 15.2.1 (Progress towards sustainable forest management). The release of the SEMAFOR study and the possible guidance to be provided by the Committee and the Commission at Las2017 coincides with the preparations for the next cycles of the global and regional reporting on forests and SFM, notably Forest Resources Assessment 2020 (FRA2020) and the joint Forest Europe/ECE/FAO 2020 reporting on the pan-European indicators. In this context, SEMAFOR, and in particular the results of its pilot application, provide valuable material for future work in this regard.

29. The Committee and the Commission are invited to:

(a) Review the results of the project, in particular the pilot application of SEMAFOR;

(b) Decide on the future development of the tool, including possible recommendation of its application in the next cycle of the pan-European reporting.

Annex I

Acknowledgments

1. Many people have contributed to the SEMAFOR project over more than five years. Mr Kit Prins led the work from the beginning, and did most of the analysis and writing. The ECE/FAO Team of Specialists on Monitoring Sustainable Forest Management, under the leadership of Mr Kari Korhonen and Mr Stein Tomter, discussed the concept and earlier drafts in a detailed and constructive way, and reviewed progress and provided guidance at their regular meetings.

2. Special thanks are due to the national correspondents in the twenty participating countries, many of whom are also members of the Team of Specialists. They played a vital role, first by providing information through the pan-European reporting process, and then by engaging in a constructive dialogue on the accuracy, context and response to the results of the SEMAFOR study.

3. Special thanks also to the Governments of Finland and Switzerland for their financial support, without which this work would not be possible.

Annex II

Parameters used in the assessment of sustainable forest management

Criterion 1: Forest resources and carbon

Indicator		Parameter	Category
1.1	Forest area	Area of forest as % of total land area (forest cover)	Context
1.1	Forest area	Forest/population ratio (ha of forest/person)	Context
1.1	Forest area	Annual average percent change[3] in forest area in most recent ten-year period	Assessment Threshold: any negative change
1.1	Forest area	Annual average percent change in area of forest available for wood supply (FAWS) in most recent ten-year period	Assessment Threshold: any negative change
1.2	Growing stock	Growing stock per hectare of FAWS	Context
1.2	Growing stock	Annual average percent change in growing stock on FAWS in most recent ten-year period	Assessment Threshold: any negative change
1.3	Age structure and/ or diameter distribution	Imbalance in age structure	Background
1.4	Carbon stock	Annual average percent change in total forest carbon stock, last ten-year period,	Background[4]

Criterion 2: Forest health and vitality

Indicator		Parameter	Category
2.1	Deposition of air pollutants	Percentage of natural ecosystem area at risk of eutrophication	Assessment Threshold: >80%
2.2	Soil condition	C/N index, median value for country	Assessment Threshold: <1
2.3	Defoliation	Percent of sample trees in defoliation classes 2+3+4	Background

[3] Calculated as percentage change over the whole period, divided by the number of years (i.e. no calculation of compound interest rates). Applies also to indicators 1.2 and 1.4.

[4] Changes in carbon stocks are important, and data are available. However, for assessment purposes, these trends will duplicate the trends for growing stock, as in most cases, carbon is estimated on the basis of growing stock.

2.4	Forest damage	Percent of forest area with damage[5] by biotic, abiotic and human-induced causes (ten-year average) – except fire damage	Assessment Threshold: >5%[6]
2.4	Forest damage	Percent of forest area damaged by fire annually (ten-year average)	Assessment Threshold: >2%

Criterion 3: Productive functions of forests

Indicator		Parameter	Category
3.1	Increment and fellings	Ratio fellings/NAI on FAWS, most recent ten-year period, in %	Assessment Threshold: >100%
3.2	Roundwood	Value of marketed roundwood, per hectare, 2012, €/ha/year of FAWS	Assessment Threshold: <€10/ha/year
3.3	Non-wood goods	Value of marketed non-wood goods, per hectare of forests and other wooded land (FOWL), €/ha/year of forest	Context
3.4	Services	Value of marketed services, per hectare of FOWL, €/ha/year of forest	Context
3.5	Forests under management plans	Percentage of FOWL under formal management plan or equivalent	Assessment Threshold: <50%

Criterion 4: Biological diversity in forest ecosystems

Indicator		Parameter	Category
4.1	Tree species composition	Share of multi species stands in FOWL, most recent period, %	Assessment Threshold: any negative change
4.2	Regeneration	Share of natural regeneration in total regeneration, change over most recent 10 year period, %	Assessment Threshold: any decrease
4.3	Naturalness	Share of forest undisturbed by man in FOWL, %	Context
4.3	Naturalness	Share of plantations in FOWL, %	Context

[5] Area with damage avoids double counting of damage from different causes. It describes a state in a given year, not the area where damage has occurred in a specific year.

[6] This warning level will only be used if there is a significant improvement on data quality compared to that reflected in the State of European Forests (SoEF) 2011.

Indicator		Parameter	Category
4.4	Introduced tree species	Share of introduced (including invasive) tree species in FOWL, %	Context
4.4	Introduced tree species	Change in share of invasive species, most recent 10 year period, %	Assessment Threshold: any increase
4.5	Deadwood	Change in volume of deadwood per m³ of growing stock on FAWS between two most recent reports, m³/ha	Assessment Threshold: any decrease
4.6	Genetic resources	Share of forest land managed for conservation of genetic resources, %	Background
4.7	Landscape pattern	Landscape pattern index: normalised connectivity per landscape unit and average proportion of "core natural" forest.	Background
4.8	Threatened forest species	Number of threatened forest tree species as % of total forest tree species	Assessment Threshold: lack of information on parameter
4.9	Protected forests	Area of forest/FOWL strictly protected[7] for conservation of biodiversity as % of total forest	Assessment Threshold: <3%

Criterion 5: Protective functions of forests

Indicator		Parameter	Category
5.1	Protective forests – soil, water and other ecosystem functions	Change in area of forest designated as having protective functions (5.1+5.2)	Assessment Threshold: decrease
5.2	Protective forests – infrastructure and other managed natural resources		

[7] MCPFE classes 1.1 and 1.2 only.

Criterion 6: Socio-economic functions of forests

Indicator		Parameter	Category
6.1	Forest holdings	Share of publicly owned forest, most recent period, %	Context
6.1	Forest holdings	Percentage of private forest area in size class of holdings under 10 hectares	Context
6.2	Contribution of forest sector[8] to GDP	Share of GDP taken by forest sector (not including forest industries), most recent period, %	Context
6.3	Net revenue	Net entrepreneurial revenue per hectare, most recent period, in €/ha/year	Assessment Threshold: < €5/ha/year
6.4	Expenditures for services	Net government expenditure per hectare forest, average of most recent two periods, in €/ha/year	Context
6.5	Forest sector workforce	Forest sector labour force as % of total workforce	Context
6.6	Occupational safety and health	Total fatal and non-fatal accidents per 1,000 workers, change over two most recent reports (centred on 2005 and 2010)	Assessment Threshold: increase in accident rate and/or lack of information on accident rates.
6.7	Wood consumption	Consumption of wood products per head, 2010-2012, m³ roundwood equivalent (RE), most recent 3-year average	Context
6.8	Trade in wood	Net imports of roundwood and forest products as % of apparent consumption (both in m³ roundwood equivalent(RE)), most recent 3-year average	Context
6.9	Energy from wood resources	Share of energy from wood in national energy production, %	Context
6.9	Energy from wood resources	Share of direct woody biomass removals for energy purposes from forests and outside forests, %	Context
6.10	Accessibility for recreation	Area accessible for recreation as % of area of FOWL, most recent year	Assessment Threshold: <85%
6.11	Cultural and spiritual values	No meaningful parameter found	NA

[8] International Standard Industrial Classification and Statistical Classification of Economic Activities in the European Community, commonly referred to as NACE (for the French term "nomenclature statistique des activités économiques dans la Communauté européenne") (ISIC/NACE) Section: A - Agriculture, forestry and fishing; Division: 02 - Forestry and logging.

Pan-European qualitative indicators for sustainable forest management
Overall policies, institutions and instruments for sustainable forest management

Indicator		Parameter	Category
A.1	National forest programmes or similar	Date and status of NFP or similar	Context
A.2	Institutional frameworks	Number of staff who formulate and administer[9] forest policy and law, per hectare of forest	Context
A.3	Legal/regulatory framework	Date of forest law and of most recent formal statement of forest policy	Context
A.4	Financial instruments/ economic policy	Total official transfer payments/subsidies, in €/ha/year of private forest	Context
A.4	Financial instruments/ economic policy	Payment from public budget to state forest organization (SFO)[10], in €/ha/year of public forest	Context
A.4	Financial instruments/ economic policy	Public expenditure on research, education and training per hectare of forest, €/ha/year	Context
A.5	Informational means	Existence of a formal communication and outreach strategy	Context

[9] Excludes staff employed to manage public forests. If the state forest organization is also responsible for policy and administration, include only those staff, not those directly employed for forest management. Also excludes staff for research education and training, which are covered below. It should include (if possible) staff from other branches who administer forest policy, broadly defined: work safety inspectors, staff in environmental ministries (conservation of biodiversity), etc.

[10] For data availability reasons, does not include contribution by SFO to public budget, (net transfer).