*UNECE/FAO Team of Specialists on Monitoring of Sustainable Forest Management*

**Proposed system for interactive reporting on the sustainability of forest management**

On the basis of the experience with SoEF 2011, the decisions of parent bodies and the discussion of the Team of Specialists in St Petersburg, as well as the fact that the next assessment period is already starting, we are submitting for preliminary discussion a method to report in an interactive way on sustainability of forest management at the pan-European level. We recognise that the whole project is very ambitious, and that many aspects will be changed over the course of the preparatory discussions, but hope that putting a (near-complete) suggestion on the table will accelerate and focus discussion on achieving a realistic solution. In our view, the discussions on the topic have shown that a credible international system of reporting and assessment is needed as an input for policy formulation, research and communication, and that the improved data are by now adequate to deliver a credible result. The pan-European assessment should take as its starting point the officially approved criteria and indicators of sustainable forest management, and use the data collected in the on-going State of Europe's Forests reporting process. This paper does not discuss under what auspices and with what mandate the system should be put into practice, as this requires guidance from policy level bodies, once the method has been developed. This paper proposes, for review:

1. Principles and methods for the reporting
2. A process to analyse the data and arrive at an assessment, in cooperation with national correspondents
3. Proposals as to how the results might be presented
4. Definitions of a few key terms
5. A list of parameters which might be used in the system

More information about all the pan-European indicators, and comments on how and whether they can be used for the reporting on sustainability of forest management, is available in the related background document (http://www.unece.org/fileadmin/DAM/timber/docs/sfm/ToS_SFM_2013/Reporting-system.docx).

## 1. Principles and methods of the proposed system

- The system aims to report on the sustainability of forest management at the national or subnational[1] level. It aims to answer two questions:
  - o What are the areas of concern with regard to sustainability (in a given country)?
  - o How are the areas of concern (in a given country) being addressed now?
- The system is not designed to assess sustainability at the forest administration/forest management unit level.
- The reporting system also aims to communicate strong and weak aspects of a given country's situation with regard to sustainable forest management, on an objective basis, helping national policy makers to compare their situation with that of other countries.
- It aims to cover all aspects of SFM, as described by the pan-European criteria. All criteria are considered equally important.
- The aim is to develop a reporting structure which is balanced, credible, objective and useful to policy makers: the latter requirement implies that a clear "story" emerges, and that areas of concern with regard to SFM are not concealed. In fact, we consider that the most important function of the system is to identify actual or potential areas of concern, so that necessary corrective action, inside or outside the forest sector, can be taken.
- National and local circumstances vary widely, and there is no single ideal sustainable outcome, to which countries would be expected to aspire. It does not make sense to say that forest management in a country is "very sustainable" or "more sustainable" (than elsewhere). The system therefore focuses on indicating whether or not the situation is sustainable, by identifying "areas of concern", and the instruments being used to address them, rather than on identifying areas of exceptionally good performance. If no existing or

---

[1] For instance provinces or autonomous regions which have responsibility for forest policy. It is not applicable at the level of counties or communes.

emerging areas of concern with regard to sustainability are identified, the situation is considered sustainable.

- Not all indicators are used for the assessment itself: there are many indicators, but some of them still have low data quality or are hard to use for a meaningful assessment. Furthermore, many indicators are descriptive of the basic context, arising from geography, ecology and history, rather than indicators of possible areas of concern[2]. All indicators were reviewed (see annex 1) and a decision taken for each as to whether it should be used for "assessment", "context" or "background". Only the "assessment" parameters are used to identify areas of concern. The reduced number of "assessment" parameters also makes the story clearer.

- For each indicator, one or more size-neutral[3] parameters have been identified, making it possible to compare countries fairly. For the assessment parameters, "warning levels" are identified, which can indicate whether, for that topic, there might be concern about sustainability. However, the indicator will not be firmly identified as an area of concern until there has been an in depth review, with country participation, putting the area of concern in context and identifying any special circumstances[4]. This process is described in the next section. The quantified "warning level" is thus the first filter of a process, not a rigid final judgement.

- The warning levels for areas of concern about sustainability are the same for all countries, despite major differences between countries in their basic situations. It would be confusing and severely reduce the credibility of the whole exercise if countries were each to set their own warning levels. It would also make any reporting on sustainability of forest management at the regional level difficult and subjective.

- Policies and institutions, and governance in general, are a key part of SFM: indeed policy instruments are the main means of achieving sustainability and addressing threats. In the *State of Europe's Forests* reports, information is collected about policies and institutions under the qualitative indicators, but the information collected has so far been rather descriptive than analytical and has not addressed the question of whether the policy instruments in place are appropriate or sufficient for the need. Part B of the qualitative indicators attempts to link the instruments to specific policy areas, but in practice the responses to SoEF 2011 were quite non-specific (most just referred to the forest law) and were not directly linked to the outcomes as monitored by the quantitative indicators. This will be addressed during the process of dialogue with national correspondents who will be asked to describe how the country is addressing any areas of concern which have been identified.

- The results should therefore identify, by indicator and country, "areas of concern" about sustainability and how countries are addressing them. The stress on policy action to address areas of concern makes the exercise positive and provides good opportunities for communication with stakeholders.

- Data quality when identifying parameters: when deciding which parameters could be used, we took into account the availability and quality of data. However, we have ignored the situation in those countries which have really inadequate data overall, and/or very small forest resources; to base the approach on countries with the weakest data quality would reduce the whole system to a lowest common denominator approach, missing an important opportunity.

- Treatment of missing data: To implement evidence-based policy making, adequate information is necessary. Thus, truly sustainable forest management is impossible without adequate information for all the relevant parameters. However, when assessing the sustainability of forest management, "No data" is not the same as "Area of concern": the situation for that indicator could be satisfactory, even excellent, but simply not measured. SoEF 2011 assigned the lowest assessment to "No data", but some considered this

---

[2] For instance, 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 basic situation results from history and ecology and represents a starting point in the assessment of SFM, not an element of it.

[3] For instance percentages and ratios ($m^3$/ha etc.)

[4] One example would be when fellings in one year were much higher than increment, because of the need to remove wood after a storm, not because of systematic over-cutting.

too harsh[5], or misleading. We propose that in the forthcoming reporting, "No data" be given a separate identity (i.e. not used to identify warning levels), but absence of data should be made clear in the reporting process.

- Time reference: wherever possible, the warnings should refer to a recent period, typically the most recent five or ten years (depending on type of parameter), so that changes can be identified, and meaningful reassessments carried out regularly. When areas of concern are identified they should be put in context: continuation of long term trend, new development, special circumstances etc. For most forest linked parameters, there are few primary data for trends over shorter periods than five years.

## 2. Process of analysis and assessment

The following stages are proposed:

- **Data collection** for the assessment will be part of the work for SoEF 2015, which covers all the parameters identified for context or assessment. Data for the assessment exercise will be checked and reviewed along with the other SoEF data. There will be no separate data collection for the assessment exercise.
- **Analysis of data**: calculation of size neutral indicators, for context and assessment parameters, identification by authors of indicators where warning levels have been exceeded.
- **Response by national correspondents**, who will be asked to respond to the warning levels, and answer the following questions:
  - o **Accuracy of information**: Are the data correct? Has the latest analysis uncovered data related problems which were not previously apparent?
  - o **Background and context**: Are there specific circumstances which indicate that there is no need to be concerned even though the standard warning levels have been exceeded? If so, what is the background and explanation?
  - o **Policy response**: If concern about an indicator is justified, what measures are being taken or planned to address the issue?
- The authors prepare a **regional synthesis**; presenting and analysing the national situations, including countries' responses to the warning levels, in an objective and transparent way, for the attention of policy makers (see next section on presentation of results). Data will be put in the regional and national context, and explained as necessary. There will be no policy recommendations in this study, which should be the start, not the end, of an evidence-based reflection on policies for sustainable forest management in Europe. This study will be brought to the attention of appropriate international bodies, and comments invited from experts and policy makers.

## 3. Presentation of results
The analysis would be based on two types of table:
- Tables showing the values[6] for the context and assessment parameters for all countries, similar to tables 87-92 of SoEF 2011. These might be supplemented or replaced by tables organising the same data by country in a standardised country profile
- For each country, a list of potential areas of concern and how they are being addressed, along the lines set out below. These tables would only cover those assessment parameters where the warning level had been surpassed, and would also note when data were insufficient to identify areas of concern. Such a table might be set out as follows:

---

[5] There is also a risk that correspondents faced with potentially embarrassing results might prefer not to report them, rather than expose an area of concern. Such a reaction would be very damaging to the whole assessment process.
[6] Or "No data" when that is the case.

| Potential area of concern | | | Response |
|---|---|---|---|
| | Parameter | Value | |
| 1.1 | Change in forest area | -x.x% | The causes of this are ... In response we have put in place the following measures: ..... OR This is not of concern because ... |
| 2.2 | Soil condition | C/N ratio 0.y | The causes of this are ... In response we have put in place the following measures: ..... OR This is not of concern because ... |
| 3.2 | Value of marketed roundwood | No data | There are no data because ...  To improve the data situation, the following measures are being taken: ... |
| .. | .. | .. | .. |

The accompanying text would take the following form, after a very brief overview of the basic circumstances: "Country X has areas of concern about sustainability with regard to indicators x.y, a.b, c.d, and is responding in the following ways: ...".  The assessments at the level of criteria should not be aggregated to generate a single sustainability assessment for the country, which would inevitably be the headline result and attract much attention, but might be misleading and conceal contradictory trends for different criteria.

This analysis by country would be followed by a regional synthesis by criteria identifying those criteria or indicators where there are several countries which have areas of concern, along these lines:  "For criterion X, there are many areas of concern for indicator X.y (aa countries, mostly in southern/eastern/northern/western Europe), but very few for indicator X.z".  This overview could serve to guide international efforts, helping them to focus on those areas which have been shown to be of widespread concern through an evidence-based process.

## 4.  Definitions of a few key terms

The following definitions of the three types of parameters and of the warning levels used in the assessment system are proposed**:**

**Context parameter**: describes the situation of a country with respect to a given pan-European indicator, but cannot be used to assess the sustainability of forest management.  No warning level is identified for context parameters.

**Assessment parameter**: provides information useful to assess the sustainability of forest management in a country for a given pan-European indicator.  For each assessment parameter a warning level is identified.

**Background parameter**: Cannot be used to provide reliable description or assessment of the situation with regard to sustainable forest management.  Causes might be problems with data quality or methodology of data analysis, preventing meaningful use of the information available.  No warning level is identified for background parameters.

**Warning level**: the first filter in the process of identifying an area of concern.  When an assessment parameter is over the identified warning level, the analysts contact the national correspondent to check the accuracy of the information and to collect information on the background and circumstances.  If after this dialogue, an area of concern is confirmed, the analysts then ask the correspondent what action is being or will be taken by the country to address this area of concern.

## 5. Parameters proposed to be used in the assessment of sustainable forest management

*Criterion 1: Forest Resources and Carbon*

| | Indicator | Proposed parameter | Proposed 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/head of population) | Context |
| 1.1 | Forest area | Annual average percent change[7] in forest area in most recent ten-year period | Assessment<br>Warning level: any negative change |
| 1.1 | Forest area | Annual average percent change in area of forest available for wood supply in most recent ten-year period | Assessment<br>Warning level: any negative change |
| 1.2 | Growing stock | Growing stock per ha of FAWS | Context |
| 1.2 | Growing stock | Annual average percent change in growing stock on FAWS in most recent ten-year period | Assessment<br>Warning level: 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 |

*Criterion 2: Forest Health and Vitality*

| | Indicator | Proposed parameter | Proposed Category |
|---|---|---|---|
| 2.1 | Deposition of air pollutants | Percentage of natural ecosystem area at risk of eutrophication for an emission scenario based on current legislation | Assessment<br>Warning level: >80% |
| 2.2 | Soil condition | C/N index, median value for country | Assessment<br>Warning level: <1 |
| 2.3 | Defoliation | Percent of sample trees in defoliation classes 2+3+4 | Background |
| 2.4 | Forest damage | Percent of forest area with damage[8] by biotic, abiotic and human-induced causes (ten-year average) – except fire damage | Assessment<br>Warning level: >5%[9] |
| 2.4 | Forest damage | Percent of forest area damaged by fire annually (ten-year average) | Assessment<br>Warning level: >2% |

---

[7] 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

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

[9] This warning level should only be used if there is a significant improvement on data quality compared to SoEF 2011.

*Criterion 3: Productive Functions of Forests*

|  | Indicator | Proposed parameter | Proposed Category |
|---|---|---|---|
| 3.1 | Increment and fellings | Ratio fellings of living trees/NAI on FAWS, most recent ten-year period, in % | Assessment<br>Warning level: >100% |
| 3.2 | Roundwood | Value of marketed roundwood, per hectare, 2012, €/ha of FAWS | Assessment<br>Warning level: <€10/ha adjusted for PPP[10] |
| 3.3 | Non-wood goods | Value of marketed non-wood goods, per hectare of FOWL, €/ha of forest | Context |
| 3.4 | Services | Value of marketed services, per hectare of FOWL, €/ha of forest | Context |
| 3.5 | Forests under management plans | Percentage of FOWL under officially registered/ approved/formal[11] management plan or equivalent | Assessment<br>Warning level: <50% |

*Criterion 4: Biological Diversity in Forest Ecosystems*

|  | Indicator | Proposed parameter | Proposed Category |
|---|---|---|---|
| 4.1 | Tree species composition | Share of multi species stands in FOWL, most recent period, % | Assessment<br>Warning level: any negative change |
| 4.2 | Regeneration | Share of natural regeneration in total regeneration, change over most recent 10 year period, % | Assessment<br>Warning level: any decrease |
| 4.3 | Naturalness | Share of forest undisturbed by man in FOWL, % | Context |
| 4.3 | Naturalness | Share of plantations in FOWL, % | Context |
| 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<br>Warning level: 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<br>Warning level: 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<br>Warning level: lack of information on parameter |
| 4.9 | Protected forests | Area of forest/FOWL strictly protected[12] for conservation of biodiversity as % of total forest | Assessment<br>Warning level: <3% |

---

[10] To take account of differences in prosperity and income between countries, the warning levels in € (indicators 3.2, 3.3, 3.4, 6.3) should be adjusted as a function of GDP/head, using Purchasing Power Parity.

[11] Terminology and warning level to be adapted according to decisions as regards data collection for indicator 3.5

[12] MCPFE classes 1.1 and 1.2 only

### Criterion 5: Protective Functions of Forests

|  | Indicator | Proposed parameter | Proposed 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<br>Warning level: decrease |
| 5.2 | Protective forests – infrastructure and other managed natural resources | | |

### Criterion 3: Socio-economic Functions of Forests

|  | Indicator | Proposed parameter | Proposed 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 10ha | Context |
| 6.2 | Contribution of forest sector to GDP | Share of GDP taken by forest sector, most recent period, % | Context |
| 6.3 | Net revenue | Net entrepreneurial revenue per ha, most recent period, in €/ha | Assessment<br>Warning level: < €5/ha, adjusted for PPP |
| 6.4 | Expenditures for services | Net government expenditure per ha forest, average of most recent two periods, in €/ha | 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 1000 workers, change over two most recent reports (centred on 2005 and 2010) | Assessment<br>Warning level: 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, 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), 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<br>Warning level: <85% |
| 6.11 | Cultural and spiritual values | No meaningful parameter found | NA |

***Pan-European Qualitative Indicators for SFM – Part A: Overall policies, institutions and instruments for SFM***

|  | Indicator | Proposed parameter | Proposed Category |
|---|---|---|---|
| A.1 | National forest programmes or similar | Date and status[13] of NFP or similar | Context |
| A.2 | Institutional frameworks | Number of staff who formulate and administer[14] 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 of private forest[15] | Context |
| A.4 | Financial instruments/ economic policy | Payment from public budget to SFO[16], and contribution by SFO to public budget, net transfer, in €/ha of public forest | Context |
| A.4 | Financial instruments/ economic policy | Public expenditure on research, education and training per ha of forest, €/ha | Context |
| A.5 | Informational means | Is there a formal communication and outreach strategy? | Context |

---

[13] No NFP, NFP in development, NFP in implementation, NFP in review. (includes "similar")

[14] Excludes staff employed to manage public forests. If state forest organisation 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. But 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.

[15] Needs detailed work. Ideally would include fiscal measures as well as transfer payments. Need to decide, among many other things, how to treat state forest organisations which act as private companies and receive certain state payments as if they were private owners. Coordinate with new approach for indicator 6.4

[16] This will be difficult in those countries where state forests are managed by a government department, with costs from the state budget and income from wood sales partly retained and partly transferred to the central budget.