



Figure 1. Schematic diagram showing the social, environmental and economic sustainability indicators linked to different processes along the FWC ...

... and the aggregated information yielded by ToSIA calculations.

## Halftime for EFORWOOD – and ToSIA takes shape

**The main product of the ongoing EFORWOOD project will be the computerized tool ToSIA (Tool for Sustainability Impact Assessment), which will help decision-makers to analyse effects of changes in the forestry-wood production chain. A prototype was released in the summer of 2007.**

**Marcus Lindner from EFI in Finland tells us about the status of the project:**

Within the forest sector, the sustainability concept has expanded beyond a narrow focus on sustainable wood production to much broader perceptions encompassing the environmental, social and economic sustainability of whole value chains. In this context, a new tool – ToSIA – is being developed for assessing sustainability impacts of Forest-Wood Chains (FWCs). A FWC is

a dynamic structure linking all the production processes from inputs to output products. The production processes (e.g. harvesting) convert forest resources into products (e.g. paper). The chain specifications have been elaborated in an iterative process involving both ToSIA developers and various other experts.

### Summarizes indicators

Sustainability is determined by analysing environmental indicators (e.g. energy generation and use, greenhouse gas emissions and carbon stocks), economic indicators (e.g. gross value added, production costs and investments) and social indicators (e.g. employment, wages and salaries) (Figure 1a).

ToSIA can analyse all of the information shown in Figure 1a, aggregate the indicator values along the chain and present the information

in a simple way (Figure 1b). In future applications, sustainability impacts of factors such as policy changes will be evaluated using Multi-criteria Analysis or cost-benefit analysis.

### Scots pine from plant to pellet

The tool has been tested on a Single FWCs, including a forest-defined Scots pine management system in northern Sweden that produces two

Marcus Lindner



types of products: chairs and pellets:

Typical production processes for a wooden furniture value chain were specified, e.g. the wood residues generated as byproducts of saw milling and furniture manufacture were expected to be used to produce pellets for use in private households.

The chain involves 26 production processes starting with scarification and planting of Scots pine and ending with the end-of-life of the furniture and pellets.

### Interface needed

The EFORWOOD indicators were selected and defined by an interactive process involving various stakeholders and experts.

Thirteen indicators and 42 sub-classes of indicators were included in the first ToSIA data collection and application trials. These show that the current ToSIA prototype generates meaningful results, but a user-friendly interface still needs to be developed.

When fully honed ToSIA will allow various end-users – such as forest-based industry companies, policy-makers and researchers – to define specific

FWCs and to analyse sustainability impacts of changes affecting them. It will then be possible to assess the likely effects on sustainability of both internal changes within the FWCs, e.g. changes in management or technological procedures, and changes imposed externally, by shifts in policy or market forces for instance (Table 1).

ToSIA will be developed, and data collected, in the EFORWOOD project for sustainability impact assessments at three different scales: (i) single

FWCs, (ii) case studies with regional foci (including multiple single chains) and (iii) European FWCs.

So far, data have been collected for single FWCs (providing important experience of data collection), and the collection process for the case studies has begun.

Collecting data for the European FWC will be challenging and involve numerous data collectors throughout Europe. / Marcus Lindner

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**Table 1.** Example of a comparison of three FWCs' indicators.

Alternative FWCs can be created by changing either management or technology process parameters. GHG=green house gas.

|                     |                                | FWC1    | FWC2    | FWC3    |
|---------------------|--------------------------------|---------|---------|---------|
| forest resource     | net revenue (M€)               | 10      | 10      | 10      |
|                     | employment (FTE)               | 1.89    | 1.89    | 1.89    |
|                     | GHG (CO <sub>2</sub> e) (t/ha) | -0.037  | -0.037  | -0.037  |
| harvest & transport | net revenue (M€)               | 2.43    | 2.88    | 3.99    |
|                     | employment (FTE)               | 0.83    | 0.28    | 0.17    |
|                     | GHG (CO <sub>2</sub> e) (t/ha) | 0.011   | 0.0136  | 0.0105  |
| industry (sawmill)  | net revenue (M€)               | 8.33    | 8.33    | 8.33    |
|                     | employment (FTE)               | 1.47    | 1.47    | 1.47    |
|                     | GHG (CO <sub>2</sub> e) (t/ha) | 0.003   | 0.003   | 0.003   |
| total FWC           | net revenue (M€)               | 20.76   | 21.21   | 22.32   |
|                     | employment (FTE)               | 3.99    | 3.64    | 3.53    |
|                     | GHG (CO <sub>2</sub> e) (t/ha) | -0.0220 | -0.0227 | -0.0236 |

### ABOUT EFORWOOD

EFORWOOD is a four-year (November 2005-October 2009) integrated EU project. The project involves 38 organisations in 21 countries, and has a total budget of EUR 20 million. The objective of EFORWOOD is to develop a quantitative decision support tool for Sustainability Impact Assessment of the European Forestry-Wood Chain (FWC) and subsets thereof (e.g. regional), covering forestry, industrial manufacturing, consumption and recycling.

Read more in News and Views No. 3, 2005.

## Shortcuts

### Swedish conservation politics inspired by Finland

In Finland, the biodiversity program METSO has provided a successful means to prompt forest owners to engage in conservation activities. The landowners set aside valuable forest and receive financial support depending on the biodiversity value of the forest.

The system, which relies on close cooperation between authorities and landowners, could also be a valuable complement to conservation efforts in Sweden.

The Swedish government has therefore instructed the country's Environmental Protection Agency and Forest Agency to investigate new methods to promote conservation that are based more on initiatives from the landowner and voluntary activities.

Sources:  
[www.skogsstyrelsen.se](http://www.skogsstyrelsen.se)  
[www.regeringen.se](http://www.regeringen.se)

### Increases in Russian timber taxes will lead to job losses in Finland

If the new customs tariffs programme set by the Russian Federation is implemented and no other means are found to replace fully roundwood exports from Russia, Eastern Finland will lose jobs amounting to almost 6,000 person-years, and there will be production losses amounting to almost two billion Euros.

In the forestry sector, however, employment will increase, because partially compensatory increases

in commercial roundwood removals will increase requirements for labour in harvesting and transportation.

These were some of the conclusions drawn in a joint report by Metla and the Russian Academy of Sciences.

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## Efficient planning with new technologies

**Laser-scanning techniques may herald a revolution in forest planning. The ability to acquire reliable information rapidly on the quality and quantities of forest resources will be of great help for forestry planners.**

**Work has just started on a new, partly SNS-supported, project that will explore important aspects of these techniques.**

Imagine that you are responsible for a company's harvesting operations. The harvesting and sales of the timber can be planned in considerable detail, since you have up-to-date information on individual trees – their position, volume and quality.

Data on the trees has been detected and measured using air-borne laser systems that scan the entire forest stands. In addition, information regarding individual tree stems has been automatically collected either by the harvester or by ground-based laser scanners placed in sample plots.

This scenario is not a pipe-dream. Air-borne laser scanning equipment

is already being used operationally in Scandinavian forestry.

### New project

Norway, Sweden and Finland are some of the globally leading countries in the field of laser-scanning research, and this position will be further strengthened by a new, three-year SNS-supported project (*New technologies to optimize the wood information basis for forest industries – developing an integrated resource information system; WW-IRIS*). It is primarily financed through national funds via the Wood Wisdom Network, with an additional 150 000 Euros from SNS.

The project will develop and optimize laser-scanning methods for assessing wood qualities and

quantities. It will also further improve the information flow on wood resources by utilizing improved information from laser scanner-aided inventories.

The participating countries (Norway, Sweden, Finland and Germany) will conduct field studies to learn how the techniques should be further developed for use in places with different conditions, including forest plantations in Brazil.

Sixteen partners are involved in the project, which is being coordinated by Professor Erik Naeset at the University of Life Sciences in Norway.

*SNS project 2008-103. 150,000 Euros.*

*Project period 2008–2010.*

*Read more: [www.woodwisdom.net](http://www.woodwisdom.net)*



*An intensity image produced by using the tree dimensional coordinates of reflection locations of laser pulses.*

## New Nordic network activities

**The research cooperation networks are core recipients of SNS' research funding. The SNS board has recently granted 148,000 Euros for the following new network activities in 2008:**

**1** A Nordic-Baltic network for PhD-students in silviculture will arrange a workshop. *Contact: urban.bergsten@sisko.slu.se*

**2** A Scandinavian forest economy seminar will be held. *Contact: hans.hoen@umb.no*

**3** A network on climate change risks will establish a platform for discussions, joint research activities and exchange of information. *Contact: elina.vapaavuori@metla.fi*

**4** Noltfox will continue to collect data about long-term forest experiments. *Contact: kristian.karlsson@metla.fi*

**5** The role of roots in the carbon cycle will be further investigated in a new project. *Contact: toril.eldhuset@skogoglandskap.no*

**6** The Nordic working group on the ecology of primeval boreal forests (PRIFOR) will provide training for PhD students. *Contact: bengt-gunnar.jonsson@miun.se*

**7** The Nordic cooperation group for forest inventory will arrange a meeting and seminar. *Contact: Arnor Snorrason, arnor@skogur.is*

**8** A "Common roots, common future" meeting will be held to strengthen awareness of the common cultural heritage of the Nordic countries. *Contact: Jette Baagoe, baagoe@jagtskov.dk*

**9** A meeting will be held in St Petersburg on cross-border biodiversity monitoring and conservation. *Contact: pekka.kaupi@helsinki.fi*

*Read more: [www.nordicforestresearch.org](http://www.nordicforestresearch.org)*

*Besides these new network activities, the SNS board has allocated 270 000 Euros to the centres of advanced research (CARs). See News and Views No. 1, 2005.*

# Forest management in Europe is sustainable

**Are Europe's forests sustainably managed? The answer is a qualified "yes", according to a joint report by the Ministerial Conference on the Protection of Forests in Europe, the United Nations Economic Commission for Europe and the FAO.**

The report compiles up-to-date information on all aspects of sustainable forest management in Europe and Russia. The 247-page booklet is a goldmine for those seeking recently collected statistics on Europe's forest resources. Traditional figures on growth, yield, acreage and sales are naturally included, but in addition the report's authors have striven to compile information on biodiversity, health, non-wood goods and services, and socioeconomic issues. Changes over time are also covered, since many indicators are presented for 1990 and 2005.

Europe and Russia comprises 46 countries, and it has been a challenge for the authors to collect as comparable data as possible.

They have been largely successful for traditional variables such as forest area, standing volume etc., but there are significant gaps and/or heterogeneity in the data for other indicators, such as the roundwood market, bioenergy, or frequencies of threatened species.

Nevertheless, the compilation presents many facts and allows many conclusions to be drawn, including the following:

- The forested area in Europe has continued to grow (by 13 million ha over the last 15 years)
- Wood volumes have increased by 358 million m<sup>3</sup>/year
- Storms, pollutants and forest fires remain stress factors for the forests
- The value of non-wood goods and services is increasing and exceeds the revenue from wood sales in some regions
- The most economically important non-wood goods and services are

Christmas trees, mushrooms, fruits and berries.

- Forest management increasingly promotes biodiversity
- Natural tree species dominate; introduced species cover less than 1% of the area.
- The proportion of protected forests has increased, and currently accounts for 5% of the total forest area
- Excluding Russia, almost half of the forest area is owned by private forest owners
- 4.3 million people work in the European forest sector. Job opportunities have dwindled, but the rate of job losses is slowing.
- A European citizen visits the forest 12 times per year, on average, with large variations among countries.

*Source: State of Europe's forests 2007. The MCPFE Report on sustainable forest management in Europe.*

*Photo: M Werner, Skogforsk*



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- relevant to the Journal
- interesting for the readers.

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