



UNECE



Food and Agriculture
Organization of the
United Nations

Exchange of Experiences in Forest Sector Outlook Studies and Related Work

Koli, Finland, February 14, 2019

MEETING REPORT

The took place on 14 February 2019 in Koli, Finland, back-to-back with the DIABOLO final conference. The meeting was hosted by the UNECE/FAO Forestry and Timber Section. Participants included representatives from ministries, forest agencies, research institutes, the private sector and international organizations. (See list below)

Name	Organization
Mr. Orifjon Abidov	European Panel Federation
Dr. Iciar Alberdi	INIA-CIFOR
Dr. Johannes Breidenbach	Norwegian Institute of Bioeconomy Research
Dr. Igor Buksha	Ukrainian Research Institute of Forestry and Forest Melioration
Dr. Oleh Chaskovskyy	Ukrainian National Forestry University
Dr. Matthias Dees	University of Freiburg, Institute of Forest Sciences
Ms. Nagy Dora	National Food Chain Safety Office (Hungary)
Mr. Andreas Eriksson	Swedish Forest Agency
Ms. Birgit Lia Fain	UNECE/FAO Forestry and Timber Section
Dr. Nicklas Forsell	International Institute for Applied Systems Analysis (IIASA)
Mrs. Alexandra Freudenschuss	Austrian Research Centre for Forests
Ms. Patrizia Gasparini	Consiglio per la ricerca in agricoltura e l'analisi dell'economia agraria
Mr. James Griffiths	Sustainable Forestry Initiative (SFI) Inc
Mr. Charles Harper	University College Dublin
Dr. Serhii Havryliuk	Ukrainian National Forestry University
Ms. Annika Hyytiä	University of Helsinki
Mr. Frank Jensen	University of Copenhagen
Dr. Ragnar Jonsson	European Commission Joint Research Centre
Dr. Matleena Kniivilä	Natural Resources Institute Finland
Ms. Marja Kokkonen	Ministry of Agriculture and Forestry
Dr. Anu Korosuo	International Institute for Applied Systems Analysis (IIASA)
Dr. Nikos Koutsias	University of Patras
Mr. Marko Kovac	Slovenian Forestry Institute
Mr. Pál Kovácsévics	National Food Chain Safety Office Forestry Directorate- Hungary
Mr. Makovskis Kristaps	LSFRI Silava
Mr. Dzadzamia Lasha	Deutsche Gesellschaft für Internationale Zusammenarbeit (GIZ)
Mr. Markus Lier	Natural Resources Institute Finland (Luke)
Mr. Torgny Lind	Swedish University of Agriculture Sciences

Prof. Udo Mantau	INFRO e.K. Information Services for Resources
Mr. Gheorghe Marin	National Institute for Research and Development in Forestry "Marin Dracea" (Romania)
Dr. Alexander Moiseyev	European Forest Institute
Dr. François Morneau	IGN, National forest inventory (France)
Dr. Prakash Nepal	North Carolina State University
Prof. Maarten Nieuwenhuis	University College Dublin
Dr. Thomas Nord-Larsen	Faculty of Science University of Copenhagen
Ms. Leonia Nunes	Instituto Superior de Agronomia (Portugal)
Prof. Tuula Packalen	Natural Resources Institute Finland
Prof. Francisco Manuel Cardoso Rego	Instituto Superior de Agronomia (Portugal)
Dr. Nele Rogiers	Swiss Federal Office for the Environment
Dr. Klemens Schadauer	Austrian Federal Research and Training Centre for Forests, Natural Hazards and Landscape
Dr. Mart-Jan Schelhaas	Wageningen Environmental Research
Mrs. Tuija Sievänen	Natural Resources Institute Finland
Dr. Allan Sims	Estonian Environment Agency
Mr. Jan Staubach	Deutsche Gesellschaft für Internationale Zusammenarbeit (GIZ)
Mr. Florian Steierer	UNECE/FAO Forestry and Timber Section
Dr. Andrzej Talarczyk	Bureau for Forest Management and Geodesy (Poland)
Dr. Stein Michael Tomter	Norwegian Institute of Bioeconomy Research
Mr. Paata Torchinava	Department of Biodiversity and Forestry, Ministry of Environmental Protection and Agriculture of Georgia
Dr. Renats Trubins	Swedish University of Agricultural Sciences
Mr. Mark Twomey	Department of Agriculture, Fisheries and Food (Ireland)
Mr. Jo Van Brusselen	European Forest Institute
Dr. Jari Vauhkonen	Natural Resources Institute Finland (Luke)
Dr. Cedric Vega	IGN
Dr. Hans Verkerk	European Forest Institute
Mr. Jeremy Wall	European Commission
Dr. Holger Weimar	Thünen Institute
Mr. Stuller Zoltan	National Food Chain Safety Office (Hungary)

Note: All presentations are available under www.unece.org/forests/fsosday2019.

Item 1: Welcome

Ms. Marja Kokkonen, Director of the Department of Forestry, Ministry of Agriculture and Forestry opened the meeting, welcomed participants and thanked them for coming to Koli, Finland. With respect to forest sector outlook modelling, she stressed the need for a transparent process including the data being used and making results available to the public.

Ms. Birgit Lia Fain, UNECE/FAO Forestry and Timber Section, introduced the agenda for the day and thanked the colleagues from the DIABOLO project for the great support and collaboration in organizing the joint event.

Item 2: National Outlook Modelling

Ms. Kokkonen presented the Finish National Forest Strategy 2025 as well as the interactive process that accompanied the development of the strategy. The process included an analysis of major trends and drivers that will impact the forest sector until 2040 such as decreasing natural resources, climate change, growth in Asia and Africa, urbanization, digitalization, and a movement towards the low-carbon, intelligent circular economy. She noted that the National Forest Strategy 2025 is a tool for the implementation of the national bioeconomy strategy and that it will be implemented starting from April 2019.

Dr. Holger Weimar, Thünen Institute, informed about two scenario case studies conducted in Germany: the finished project WEHAM Scenarios and the ongoing project BEPASO. The WEHAM scenarios' objective was to provide insight on how the German based forest sector might respond to changing timber supply potentials. It used the data from the National Forest Inventory (NFI) for the supply side modelling which was then adjusted with the estimated dead wood supply and fuel wood demand. For the demand side, the team applied the Global Forest Products Model (GFPM) developed by Buongiorno, which was further enhanced with a disaggregation of roundwood in coniferous and non-coniferous. The BEPASO project analyses amongst other issues how supply and demand structures of traditional and emerging wood products might change in light of growing competition for raw material. For this purpose, they added the product category dissolving pulp with the subcategories cellulose fibres and cellulose derivatives to the GFPM.

The subsequent Q&A session included the following questions and respective answers by Dr. Weimar:

- How long did it take to re-programme the global model?
 - Roughly, one person full-time for two years.
- How was the estimation of price elasticities for new products done?
 - For the newly included cellulose fibres some data exists on COMTRADE, which was used for estimating the price elasticity. If that had not been available, assumptions would have been needed.
- How is the dialogue with stakeholder and society for the BEPASO project done in practice?
 - Consultation with stakeholders are done in three rounds. Aim is to set up and quantify the scenario storylines. For consultation of/with society, randomly chosen people in Hamburg, Stuttgart and Leipzig were consulted in group discussions. Firstly, an open discussion on perceptions of and expectations from the bioeconomy, and secondly a round with more specific questions.

Prof. Tuula Packalen, Natural Resources Institute Finland and leader of the UNECE/FAO Team of Specialists (ToS) on Forest Sector Outlook, shortly presented the mandate and work of the ToS. Furthermore, she informed about the national supply modelling conducted under the DIABOLO project with the use of the European Forest Dynamics Model (EFDM). In the case of

Finland, the EFDM was used to model the effects of climate change and forest management. She advocated for collaboration in order to replicate the German example of combining the use of NFI data in supply modelling with a global demand model in other countries. The participant from Denmark confirmed interest in this approach.

Item 3: International Research

Dr. Nicklas Forsell, IIASA, reminded the participants of the significant gap between the climate goals under the Paris Agreement and the scenarios based on current Nationally Determined Contributions (NDCs) and the implied need for large structural changes. He presented the Global Biosphere Optimisation Model (GLOBIOM) and its application in modelling global CO₂ emission pathways. GLOBIOM has been used for assessments in the EU28 region, for which detailed data exists, as well as for other countries and regions such as Brazil, Congo Basin, Indonesia and Malaysia. He stressed the impact of increasing bioenergy demand and explained that a range of different pathways exist to reach the climate targets.

The subsequent Q&A session included the following questions and respective answers by Dr. Forsell:

- How is the demand set up over time?
 - A careful sensitivity analysis is necessary for estimating future demand. Quite a lot of data and information exists for the food sector including current and estimated future calories consumption. Less data is available for the forestry sector.
- Regarding the SSP scenarios: Is every SSP calculated with a different model or is the same model used to calculate all SSPs?
 - The SSPs database provide the information on population and GDP development for the models. Each model was then used to provide further detail for the respective SSP it was applied to. However once set up, each model can calculate the outcome of all the SSPs.

Dr. Hans Verkerk, European Forest Institute (EFI), presented on Climate-Smart Forestry (CSF), an approach which combines climate change mitigation and adaptation in the management of forests and is spatially diversified depending on local conditions and risks. It calls amongst others for global afforestation while avoiding deforestation and degradation, as well as improved forest management practices. Furthermore, it covers the aspect of substituting non-renewable carbon-intensive materials with sustainable wood products. However, with respect to possible substitution effects, a new study EFI that reviewed published substitution factors show that these factors are lower than those reported in an earlier review study. Mr. Verkerk also informed about other outlook related work at EFI such as the BioMonitor project. The objective of this project is the development of a monitoring and modelling framework for the European Bioeconomy. In this context, he mentioned a knowledge gap concerning new wood-based products and their potential economic and environmental impact.

The subsequent Q&A session included the following question and respective answer by Dr. Verkerk:

- How is climate change adaptation included in your modelling work?
 - So far climate change adaptation is not included in the modelling. EFI is currently developing the respective concept with a focus on forest fires.

Dr. Ragnar Jonsson, European Commission Joint Research Centre, informed on the JRC Biomass Assessment Study and described its five building blocks: review of literature and existing datasets, assessment of current biomass supply and potential, biomass balances, supply chains and impacts, and modelling and future prospects. With respect to the latter, the carbon budget model of the Canadian Forest Sector is used in combination with a Global Forest Trade Model. The linkage of these two models also led to two studies concerning the European forest-based sector.

The subsequent Q&A session included the following questions and respective answers by Dr. Jonsson:

- How are the two models CBM and GFTM linked?
 - At present this is done with Excel tables. For the future it would be preferable to have it more automated.
- Are CBM and GFTM open source models?
 - GFTM can be used by everyone. CBM is not open source, however Canada might be moving to an open source model.

Dr. Mart-Jan Schelhaas, Wageningen Environmental Research, informed about the EFI network project Forest Management Scenarios for Adaptation and Mitigation (FORMASAM). With a focus on Europe, FORMASAM intends to answer several key questions such as ‘Which regions and forest types are suitable to focus on biomass production for bioenergy generation, on production of long-lived high-quality timber materials, on conserving carbon-rich forests or on other forest services and products and what are the trade-offs of these management strategies with respect to climate change mitigation and adaptation?’. He also presented possible ways of collaboration between FORMASAM and the ToS on Forest Sector Outlook.

The subsequent Q&A session included the following question and respective answer by Dr. Schelhaas:

- What kind of contributions could or should be provided from the ToS members to the FORMASAM project?
 - A key contribution would be feedback from the ToS members on preliminary results from the different management scenarios with respect to feasibility and likelihood.

Item 4: Scenario modelling for the next FSOS followed by discussion

Ms. Fain explained the process that had been followed so far in the development of the next FSOS study as well as the next planned steps. She stressed that the modelling results presented at the event are based on the decisions and recommendations of the ToS on Forest Sector Outlook as well as the Joint Working Party (JWP) on Forest Statistics, Economics and Management.

Dr. Prakash Nepal, North Carolina State University, presented the work undertaken by the US modelling team (Dr. Jeffrey Prestemon and himself) for the next UNECE/FAO Forest Sector Outlook Study (FSOS). Following the recommendations from the ToS and the JWP, three reference scenarios and four alternative policy scenarios were developed. The reference scenarios were directly adopted from the IPCC-inspired five shared socioeconomic pathways (SSPs). The results of SSP2 ("Middle-of-the-road" world vision), SSP3 (Poorer and less equal world) and SSP5 (Wealthier and more equal world) were included in the background document of the event. SSP1 and SSP4 were excluded as they yield very similar results as two of the other SSPs. With respect to the alternative policy scenarios, the following four scenarios were modelled: High Forest Area (HFA) with a total forest and planned forest area increase by 10% by 2040, High Wood Consumption in All Countries (HWC All) with a doubling of sawnwood and panel products consumption by 2040 relative to the reference scenario, High Wood Consumption in Selected Countries with the doubling of demand taking place in the six most populous non-UNECE countries (Brazil, China, India, Indonesia, Mexico and Pakistan) and the combination of HFA and HWC All. These scenarios provide input to eight of the seventeen prioritized policy questions. Dr. Prakash also informed how existing literature and research can provide answers to some of the remaining questions. The scenarios were calculated using the Global Forest Products Model (GFPM). After shortly explaining the main features of the model as well as the methods used for the calculation of carbon storage, Dr. Prakash presented highlights of the preliminary results for the reference and alternative policy scenarios as well as planned next steps.

The subsequent Q&A session included the following questions and respective answers by Dr. Nepal:

- Are results available at the country level?
 - Yes, results are available on the country level.
- Was a differentiation between coniferous and non-coniferous integrated in the modelling?
 - So far there is no distinction between coniferous and non-coniferous.
- Is recycled wood considered?
 - Recycled wood is not yet considered, however recycled paper is.
- How is age distribution considered?
 - Age distribution is not included, but forest density is considered with high forest density translating to lower growth rates.
- How can higher forest area lead to such a quick increase in harvest? (It takes time to harvest newly planted forest)

- The sudden increase in forest area leads to lower forest density and thus to higher growth rates (reflecting higher growth rates in the newly planted forest). The amount of harvest is a function of price.
- How can SSP5 and SSP1 lead to similar results, given that their narrative is completely different?
 - The information taken from the SSPs are population and GDP growths. These happen to be very similar for SSP5 and SSP1 despite the different narrative.
- Is deforestation included in the model?
 - Only the net change between afforestation and deforestation is captured.

After the Q&A session, the participants split into four groups which rotated answering the following five questions: (Results from group discussions included)

1. How do you assess the set-up of the reference scenarios as well as the assumptions taken for the four policy scenarios (e.g. 10% increase of forested area etc.)
 - Literature review should be undertaken in order to define parameters
 - Verification and comparison of model output to national and regional studies could be useful
 - Regional specific narratives (including current policies) instead of global narratives could be more beneficial
2. From the presented results, what do you believe is most interesting for policy makers and how should it best be presented to them?
 - Mapping of global demand for forest products and trends (NB: Pacific Rim main driver)
 - Climate change implications, e.g. scope for wood-based energy and interactions with solidwood products and carbon stocks (trees vs. wood products vs. energy)
 - Resulting need for complete life cycle assessment (LCA)
 - Presentation through maps
 - Executive summary / separate policy report focussed on answering the policy questions
 - Explain set-up: why was this approach taken, what was the aim, how should it be interpreted (and how not)
 - Not presenting results on a country level – rather regions
 - Involve countries in analysis/coming to conclusions
 - Zoom in from global perspective, thus putting ECE supply and demand in global context
 - It is an outlook. Thus, demonstrate patterns of change and make clear that it is not a forecast
3. Where do you believe is additional research and modelling necessary to better answer the policy questions? *What do we still need?*
 - Climate change mitigation: Verify assumptions, e.g. on carbon effects of longer forest rotations

- Growth of specific products: Define demand drivers for specific products e.g. building vs. paper
 - Climate change adaptation: Differentiate forest effects – e.g. for supply shifts, change wood supply from demand-side adaptation
 - Climate change adaptation: Economic disturbances including impacts of trade barriers as well as climate-driven restrictions on consumptions
 - Nature conservation and natural disturbances (linked): climate change drives higher frequency and intensity of (a)biotic damages (storms, fires, bugs) which impacts forest area, wood supply and prices and leads to lower biodiversity and ecosystems collapses
 - Cost of land (competition for land, especially through agriculture)
 - Detailed analysis of building material trends and drivers; e.g. USA: storms leading to a change towards bricks and concrete; vs. Europe: energy-efficiency needs leading towards wood
 - New bioeconomy products which are changing the industrial environment
4. Which topics not selected/covered by the policy questions are in your opinion closely linked and could be easily added to the final publication through (easy) additional modelling, post-calculations or qualitative assessments (information box)?
- Use existing information and assumptions on post-consumer wood availability
 - Impacts on nature conservation and biodiversity
 - Structural changes in paper markets in reference scenarios
 - Bioenergy and renewable energy sources (RES) targets in the EU (+Carbon Capture and Storage (CCS)?)
 - Climate change impact beyond carbon such as albedo etc.

Item 5: Closing of the workshop

Ms. Fain thanked all participants for their active participation throughout the day and closed the workshop.