



Towards harmonized assessment of European forest availability for wood supply in Europe



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ABSTRACT

The supply of wood in Europe on a sustainable basis is highly relevant for forestry and related policies, particularly in relation to (i) analysing global change mitigation strategies and carbon accounting (ii) establishing realistic forecasts and targets for wood resources, biomass and renewable energy and (iii) assessing and supporting strategies for an increased use of wood.

Therefore, it is relevant to have robust information of the availability for wood supply. The main aim of this paper is to harmonize the concept of 'forest available for wood supply' (FAWS) at European level.

The data employed in this study was acquired through two questionnaires. The first questionnaire, conducted under the framework of COST Action FP1001 and a second questionnaire was completed by national correspondents and members of the UNECE/FAO.

The analysis showed that reasons for the exclusion of forest from FAWS are diverse. Legal restrictions and specifically 'Protected areas' are considered by 79% of the countries while very few countries consider economic restrictions.

Abbreviations: (EU), European Union; (NFIs), National Forest Inventories; (SDGs), Sustainable Development Goals; (FAO), Food and Agriculture Organization of the United Nations; (C&I), Criteria and Indicators; (SFM), Sustainable Forest Management; (FRA), Global Forest Resources Assessment; (TBFRA), Temperate and Boreal Forest Resources Assessment; (FAWS), Forest available for wood supply; (FNAWS), Forest not available for wood supply; (SoEF), State of Europe's Forests; (EFSOS), European forest sector outlook study; (ToS), Team of Specialists; (UNECE/FAO), United Nations Economic Commission for Europe and The Food and Agriculture Organization of the United Nations.

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A new FAWS reference definition is provided and the consequences of using this new definition in eight European countries were analysed. Application of the proposed definition will increase consistency and comparability of data on FAWS and will result in decreasing the area of FAWS at a European level.

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1. Introduction

The availability of wood is currently an important concern relevant for several forest and related strategies. Discussions on climate change and post-Kyoto negotiations are taking place, including the estimation of carbon storage in forests, energy from wood and harvested wood products (COST 4137/10, 2010). Wood is a key resource to be taken into account for climate change mitigation because it can store carbon as well as be used as a replacement to fossil fuels. Additionally, availability of wood supply is important due to the rapid growth in demand for wood (EC, 2013), including for energy production (EC, 2009).

The importance of reporting on the availability of forests for wood supply has gained more importance in the context of the recently adopted Sustainable Development Goals (SDGs) and related indicators (Sachs, 2012). However, while the process has not yet been concluded, it can be expected that the forest available for wood supply (FAWS) will be central for the assessment of the sustainability level of forest management.

National Forest Inventories (NFIs) are the main information source for the estimation of FAWS as well as the growing stock at national level. The methods used to estimate FAWS nationally, are generally based on the exclusion of forest areas according to restrictions (e.g. protected areas, accessibility, etc.).

FAWS is one of the basic attributes collected through international forest reporting. In 1948, 'productive' and 'unproductive' forests were included in the first world report on forest resources, published by the Food and Agriculture Organization of the United Nations (FAO). Over time, meanings and contexts have changed; e.g. the set of applied terms included (i) 'productive' and 'unproductive' (ii) 'operable' and 'inoperable' (iii) 'exploitable' and 'non exploitable' forests. Despite the developing needs and context, 'availability for wood supply' has remained one of the key characteristics of forest reporting and assessment.

Terms and definitions of FAWS and 'Forest not available for wood supply' (FNAWS) established by FAO (1948) were modified in the Kotka III meeting (Finland, 1996) by the expert consultative and advisory group for The Global Forest Resources Assessment 2000 (UNECE/FAO, 2001a). The definition of FAWS established by Kotka III was the following: "Forest where any legal, economic or specific environmental restrictions do not have a significant impact on the supply of wood". Additionally, this definition was further qualified by specifying that FAWS includes "areas where, although there are no such restrictions, harvesting is not taking place, for example in areas included in long-term utilisation plans or intentions". In contrast, FNAWS was defined as "Forest where any legal, economic or specific environmental restrictions prevent any significant supply of wood".

Then, reporting on availability of wood supply was also addressed by the processes to develop criteria and indicators (C&I) for sustainable forest management (SFM). Related information appeared under the two major C&I systems applied for temperate and boreal countries, i.e. FOREST EUROPE (MCPFE, 2002) and Montréal Process (Montréal Process, 2009). In the pan-European system (FOREST EUROPE) the 'availability for wood supply' is not a separate indicator but it serves as a means to breakdown several indicators, including: forest area, growing stock, forest age/diameter structure, fellings and growth. A direct reference to 'availability for wood supply' was provided under Indicator 3.1 (Increment and fellings) according to which this indicator "highlights the sustainability of timber production over time as well as the current availability and the potential for future availability of timber".

In addition to the Global Forest Resources Assessment 2000 (UNECE/FAO, 2001a), the FAWS definition established in Kotka has been used for reporting in Temperate and Boreal Forest Resources Assessment

(TBFRA) 2000 (UNECE/FAO, 2001b), in the State of Europe's Forests (SoEF) 2003 (MCPFE, UNECE and FAO, 2003), SoEF 2007 (MCPFE, UNECE and FAO, 2007), SoEF 2011 (FOREST EUROPE, UNECE and FAO, 2011) and SoEF 2015 (FOREST EUROPE, 2015).

European forests (excluding the Russian Federation) cover an area of 210 million ha (32.8% of land area), and the majority of this area (79.3%) is reported as being available for wood supply. The proportion of FAWS related to forest area of European sub-regions are reported as follows: Central-West 94.1%, South-West 81.0%, North 78.0%, and South-East 74.1%. Central-East Europe (70.4%) is the sub-region with the lowest share of forests available for wood supply (FOREST EUROPE, 2015). Nevertheless, the national estimates reported to FOREST EUROPE that are aggregated to a sub-region are of limited comparability, as will be shown in this study.

Trends in FAWS are highly relevant for analysing the productive capacity of Europe's forest resources, however long term comparability is strongly hampered by a lack of consistency among data between countries and reporting methods over reporting cycles. An attempt to overcome these obstacles is the study by Gold (2003), which was prepared in the course of the production of the European forest sector outlook study (EFSOS I) (UNECE/FAO, 2005) and presents long-term historical trends in forest area for the majority of European countries from the 1950's to 2000. The area of FAWS in these countries increased by about 6% percent over this period. However, the study did not address the problem of data comparability between countries.

It is important to highlight that there are large-scale models such as the European Forest Information Scenario model (EFISCEN) (Nabuurs et al., 2007; Sallnäs, 1990; Schelhaas et al., 2007; Verkerk et al., 2011), which simulate future FAWS resources under assumptions of future wood demand and a given management regime (rotation lengths, residue removal). These large-scale models generally use NFI data as the basis for calculations and enable the assessment of impacts of different policy and management strategies at European level.

The initial objective of international reporting on the availability of wood supply was apparently clear: to distinguish areas (and related variables) where wood could be harvested from those where it could not. However, the managerial approaches are much more complex and the provision of consistent national data according to the proposed definition and classification of forest area as available or not available for wood supply poses many challenges. National correspondents and other specialists in forest reporting lack detailed reference definitions and restriction thresholds.

This paper aims to: (i) discuss and clarify the concept of FAWS; (ii) analyse the consistency of international information on FAWS; (iii) and provide recommendations for NFI data harmonization derived at the European level. The proposed definition of FAWS outlined will contribute to the harmonization of NFI results and the consistency of data collected internationally thereby enhancing the quality of the political decisions not only in forest management but also in the wood and energy sectors.

2. Material and methods

The data employed in this study to assess possible harmonization of FAWS at European level were acquired through two different sources: 1) a questionnaire and accompanying country status reports produced by NFI experts under the framework of COST Action FP1001 (*Improving data and information on the potential supply of wood resources: a European approach from multisource national forest inventories*) and 2) a questionnaire completed by the UNECE/FAO Team of Specialists (ToS) on

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