

# **Productive functions of forest resources**

## **Background paper to the Kotka V Expert Consultation**

### **1 Introduction**

Forests and trees outside forests provide a wide range of wood and non-wood forest products. The productive function of forest resources is a common thematic element of all the ecoregional criteria and indicator processes. This reflects an ambition to maintain an ample and valuable supply of primary forest products, while at the same time ensuring that production and harvesting are sustainable and do not compromise the management options of future generations.

Describing the forest resource as a provider of goods has traditionally been one of the main objectives of global forest resources assessments. Earlier assessments were focused on timber supply, but the concept of forest production has since widened to encompass all types of wood and non-wood forest products.

This background paper contains an analysis of the variables used in FRA 2005 related to this theme, and some specific issues and proposed changes for FRA 2010 to be discussed by the Kotka V expert consultation.

The proposals presented in this document are based on the responses to the FRA 2005 evaluation questionnaire sent to all national correspondents, FAO staff, the FRA Advisory Group and representatives of forest related organisations and reporting processes (members of the Collaborative Partnership on Forests, criteria and indicator processes and environmental NGOs). Feedback received on the release of the Key Findings of FRA 2005 and the Main Report has also been included where relevant. The proposals have not been prioritised and are presented for discussion by working group participants.

### **2 Analysis of variables related to the productive functions**

#### ***2.1 Variables included in FRA 2005 and scope of the analysis***

The following variables related to productive functions were included in FRA 2005:

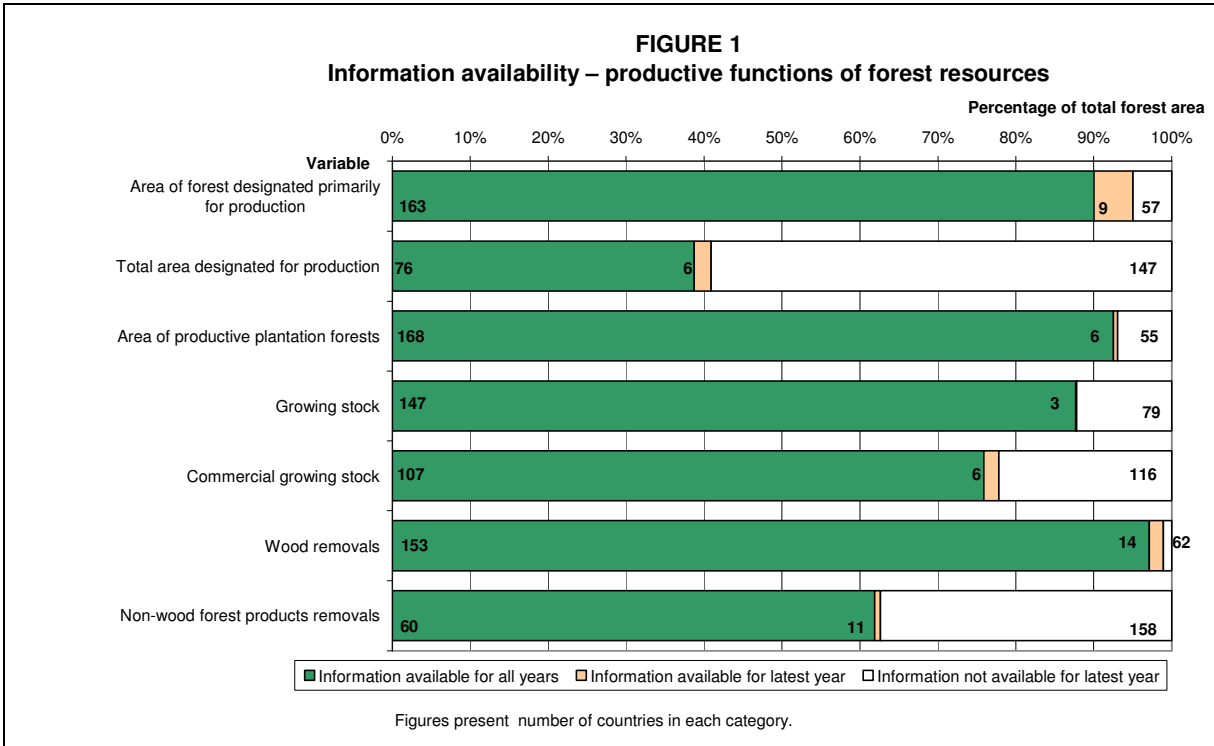
- Area designated for production (Primary function and total area with function)
- Area of productive forest plantations (characteristics)
- Growing stock
- Commercial growing stock
- Wood removals (industrial roundwood and woodfuel)
- Removal of non-wood forest products

The analysis of each of these variables includes:

- Definitions
- Data availability
- Data quality
- Methods used for data collection and estimations
- Relevance to the theme and to the needs of the user community

**2.2 Data availability**

Figure 1 below shows a global summary of the reporting status for the variables of this theme. It can be noted that particularly for two variables, lack of information is an important issue. *Total area designated for production* was only reported by countries covering about 40% of the world’s total forest area, while in the case of *non-wood forest products removals*, this figure is about 65%.



**2.3 Area designated for production**

The general aspects of the table related to designation of forest and other wooded land are discussed in another background paper and therefore not included here.

The variable as such is highly relevant for the theme, however it has been difficult to evaluate how much of the area classified as “multiple use” has production as one of its functions.

From a wood production perspective and for the needs related to forecasting future wood supply, a key issue is to extract from this table the forest area available for wood supply (FAAWS). This should in theory be estimated by the figures reported on *total area designated for production*, but few countries reported on this variable, probably due to the concept of “total area with function” being difficult to understand.

FAAWS<sup>1</sup> was part of FRA 2000, and also in FRA 1990 as “*Exploitable forests*” with a definition similar to FAAWS.

Proposal: Depends on how the general design of this table will be done:

- If “*total area with function*” is maintained, it is important that the guidelines clearly explain that “*total area designated for production*”, should reflect the area available for wood supply.
- If “*total area with function*” is removed, a new category on “*forest area available for wood supply*” should be introduced, either in the same table as designation or in a separate table.

## **2.4 Area of productive plantations**

The variable “area of productive forest plantations” is also highly relevant for the theme, as wood from forest plantations is becoming increasingly important for meeting the growing demand for wood.

FRA 2005 included the designation of forest plantations as a part of the reporting table on characteristics, although it was discussed also to have a separate table on forest plantations. The general issues on the table on characteristics are being discussed in another background paper and therefore not considered here.

The FRA 2005 is being complemented by a thematic study on planted forests. One conclusion from that study is the need to provide information on planted forests as a whole, which is the forest plantations plus the planted forest component of the seminatural forests. As a consequence, the reporting on two designations (productive and protective) should be extended to also to the planted forest component of the seminatural forests. A proposal on how to do this is presented in the background paper dealing with characteristics.

Furthermore, in order to assess the potential harvests from planted forests, it is necessary to have better information on the area of planted forests that is available for wood supply. In the planted forests thematic study, FAO made a rough estimate by assuming that a percentage of the forests planted for protective purposes also were available for wood supply. For future analysis of planted forests, it would be of great value to ask the countries to report specifically on the area of planted forests available for wood supply.

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<sup>1</sup> FAAWS was defined by FRA 2000 as: *Forest where any legal, economic or specific environmental restriction do not have a significant impact on the supply of wood. Includes areas where, although there are no such restrictions, harvesting is not taking place, for example areas included in long-term utilization plans or intentions*

## 2.5 Growing stock and commercial growing stock

Growing stock and commercial growing stock are key variables in this theme. Growing stock has been part of the global forest resources assessment since the first assessment was published in 1948. Commercial growing stock was introduced in FRA 2005.

Regarding growing stock and commercial growing stock, the following specific issues need to be considered for FRA 2010:

- Data availability and reliability, particularly regarding trend data
- The use of a standard minimum diameter for reporting of growing stock:
- Interpretation of “Commercial growing stock” and use of information

For FRA 2005, 150 countries representing about 88% of the world’s total forest area reported on growing stock, while the figure for commercial growing stock were 113 countries and 77% respectively.

Although many countries provided information on growing stock, the quality of the information is variable. A few countries with repeated national forest assessments have very reliable information, but many countries do not have good inventory data to support growing stock estimates and particularly the changes in growing stock over time. In many cases, a single estimate of growing stock per hectare was used for all reporting years, meaning that any reported trends in growing stock for these countries only reflects the changes in forest area and not changes within the forest (e.g. degradation or improvement). Furthermore, the original data on which the estimates are based are often old and partial and therefore not representative of all forests in the country. Continued support is therefore required to gradually improve inventory data in developing countries and as part of this effort address the issue of estimating changes.

FRA 2005 did not request any harmonization of reported growing stock to a specific minimum diameter limit. Considering that the growing stock figures are used for estimating carbon stocks, requesting countries to report on growing stock down to a 0 cm diameter limit would help to improve carbon estimates. One reason for not requesting harmonization in FRA 2005 was that allowing countries to use their own minimum diameter limits would facilitate reporting trends. However, as mentioned before, trend data is very weak anyway.

If considered desirable to request countries to adjust growing stock figures to a common minimum diameter limit, methods for making such adjustment (a set of adjustment functions or volume expansion factors) need to be developed. Currently, the only set of volume expansion factors were developed for tropical forests for FRA 1990 (Brown, 1990).

The variable “Commercial growing stock” has been given a fairly broad interpretation, some countries considering the entire growing stock as being commercial, other applying a much more restricted interpretation. The definition used by FRA 2005 is:

*The part of the growing stock of species that are considered as commercial or potentially commercial under current market conditions and with a diameter at breast height of Z cm or more (Z can be chosen by the countries):*

The main use of this variable should be as an input to estimates of potential wood supply in the future. Such estimates would however also need information on harvesting cycles.

Considering the limited use of this variable, it is important that the Kotka V expert consultation gives guidance on whether it should be maintained or dropped in FRA 2010.

### **Summary of proposals for FRA 2010**

- Request countries to report on growing stock for all trees having reached breast height (minimum DBH 0 cm)
- Develop tools and methods for making adjustments from any arbitrary minimum diameter down to 0 cm.
- Evaluate whether maintain or drop the variable Commercial growing stock

Furthermore, it is important to continue to support NFAs in developing countries with weak data, including also support to countries that wish to make remeasurements of their permanent sample plots which would allow for better trend estimates.

### **2.6 Wood removal (industrial roundwood and woodfuel)**

Wood removals are very relevant for this theme, although the available information on wood removals is usually not restricted only to forests.

Wood removals have been part of FRA since FRA 2000. Before that (FRA 1990), the variable “Production” was used, seemingly more or less synonymous to removals.

In the preparatory work for FRA 2005, the inclusion or not of wood removals was discussed and it was decided to maintain it for two main reasons:

- State clearly that the scope of the forest resources assessment includes the management and uses, products and services provided by the forest resources all the way to the border of the forest (to the forest gate);
- Validate the figures of the FAOSTAT database and Yearbook of Forest Products Statistics based on country submissions in response to the FAO/ITTO/UNECE/EUROSTAT Joint Forest Sector Questionnaire (JFSQ).

Data on removals were requested in terms of removed volume over bark and as five-year averages. Annual country data on removals under bark from the FAOSTAT database were made available to the countries, as well as some rough factors for converting volume under bark to volume over bark.

## **Main issues related to removals**

There are many important issues to discuss that are related to the reporting on wood removals, such as:

- Should we report on fellings or removals? Which is most appropriate in relation to the needs of the user community?
- There are considerable differences between the FRA and FAOSTAT datasets on wood removals – need to reconcile/harmonize collection of country information on removals
- It is difficult to separate wood removals from forest and OWL
- Removals estimates are underestimated (particularly woodfuel removals). Most woodfuel removals and also part of the industrial wood removals are informal and not accounted for by the countries in their national statistics.
- The definition of woodfuel removals is not fully compliant to agreed international definition of woodfuel<sup>2</sup>

## **Fellings or removals**

Fellings and removals are two different concepts, where removals only refer to the volume actually removed from the forests. The volume of cut trees, logs and cut-offs, left in the forest is not accounted for in the removal figures.

However, countries seldom possess direct information on wood removals. They either have information on cutting (or authorized cutting), or on the volume of logs that enter the industry or that is traded and these are used as proxies for estimating wood removals.

To address this issue, we need to ask ourselves how the data on wood removals that currently is reported are being used, and based on this define what we wish to report. If the main objective is to relate it to the growing stock and growth in order to analyze whether sustainable or not, reporting on fellings are more appropriate. If the main objective is to related it to the value of the good produced, removals make more sense. It is expected that the Kotka V expert consultation will give further guidance on this issue.

## **Differences in removal data between FRA 2005 and FAOSTAT datasets and the need to reconcile / harmonize collection of country data on wood removals**

A comparison done between removals estimates from FRA 2005 and FAOSTAT (adjusted for bark volume), show many differences. Out of 187 countries and territories reporting on wood removals, 92 used the FAOSTAT data (adjusted for bark) directly for the reporting to FRA 2005. The remaining 95 countries reported figures on removals different from FAOSTAT, based on national data sources or – in a few cases – expert estimates. Based on data on

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<sup>2</sup> The Unified Energy Terminology (UBET) defines woodfuel as “all types of biofuels originating directly or indirectly from woody biomass”. This means that industrial by-products (bark, sawdust, etc) also are part of woodfuels.

removals for year 2000, the frequencies of differences in percent are shown in the following table:

Difference in percent of FRA estimate 2000	Number of countries	
	Industrial roundwood removals	Woodfuel removals
≥ 10%	50	59
≥ 50%	27	36
≥ 100%	21	27

These figures show clearly that there are considerable differences between the two data sets. A FRA working paper has been prepared that shows in detail the differences between FRA 2005 and FAOSTAT regarding wood removals.

Currently, there are two processes that request countries to submit information on wood removals, the FRA process (periodically every 5-10 years) and the Joint Forest Sector Questionnaire, JFSQ (annually). In order to avoid unnecessary overlap and to reduce the reporting burden, these two processes should be harmonized. Either both processes request the specific information needed, but in such a way so that data integrity and compatibility can be ensured, or one of the processes assume the main responsibility for collecting the data (and the other process becomes a mere user of the data).

Some arguments for maintaining it as part of the JFSQ are:

- Some of the JFSQ partners may need annual statistics on removals (assumed, but not confirmed)

Some arguments for transferring the responsibility for removals reporting to FRA are:

- The value of removals is an important FRA variable, and need removals estimates as input. Reporting quantity and value by two separate processes may make it more difficult to ensure data integrity.
- In the future, removals by designation category or characteristics category may be needed, and this cannot be easily be covered by the JFSQ.

It is expected that the Kotka V expert consultation will give further guidance on this specific issue.

### **Separate reporting of wood removals for Forest and Other wooded land**

FRA 2005 requested countries to report wood removals separately for Forest and Other wooded land. Few countries have been able to make this split, as usually no data on the origin of the removals are available in the countries.

Proposal: Request data on wood removals, without any separate reporting for Forest and Other wooded land.

## **Removals not covered by national statistics**

The current figures on wood removals are usually based on official statistics either on actual removals or on authorized cuttings. Informal / illegal removals are usually not considered at all, although it is well known that in many countries such removals may constitute a substantial part of the total removals. This is particularly true as regards woodfuel, as most of the woodfuel, at least in developing countries, is gathered and removed informally. Furthermore, woodfuel are often removed from areas that are not classified as forests, such as shrublands, gardens, etc.

Considering the difficulty to get good estimates of wood removals, and particularly on wood fuel, this could be a potential subject for a more detailed thematic study as part of the FRA 2010 work, aiming at reaching some rough regional or sub-regional estimates of the magnitude of the informal activities, for example by looking at consumption and trade and calculate backwards to get an estimate of the raw material used. Such a thematic study could also evaluate the feasibility of requesting countries to report removals from planted forests separately.

## **Woodfuel definitions**

The term Woodfuel used for FRA 2005 has a definition that does not correspond to the established United Bioenergy Terminology (UBET), where the scope of this term is wider. The specific FRA statistics on woodfuel may vary considerably from other statistics on woodfuel production in the countries. As the FRA information is read by many people from the energy sector that are not familiar with traditional forest-related definitions, this may create certain confusion.

Later this year, there will be an expert consultation on the Bioenergy terminology, and this may be used as a sounding board to test the definitions used by FRA and see whether there are any good proposals for changing the FRA terminology related to woodfuel removals.

## ***2.7 Removal of non-wood forest products***

Removals of non-wood forest products (NWFP) are important for this theme, although it is well known that data are lacking from many countries.

Despite knowing that country data are weak or inexistent, reporting on NWFP was included in both FRA 2000 and FRA 2005 in order to raise awareness of the importance of NWFP, hoping that countries gradually will incorporate information on NWFP in their national statistics.

In order to improve the knowledge on NWFP removals and possibly also products and trade, one option could be to make a joint thematic study as part of both FRA 2010 and the Forest product statistics process. This study should be scheduled so that the main results could be incorporated in the FRA 2010 main report.

If such a thematic study cannot be done or if the study cannot have global coverage, NWFP reporting should be maintained in FRA 2010.

As NWFP is a very heterogeneous group, it is difficult to make universally good categorization, and some categories may become very wide in certain countries. If the categories are maintained in FRA 2010, one way to improve the level of detail could be to ask countries to report on individual products for the most important categories (e.g. food). However, this again is an issue that probably would be better covered by a thematic study.

### **3 Summary of proposals for FRA 2010**

#### **3.1 Deletions**

Possibly remove “Commercial growing stock”

Decide whether wood removals should be reported by FRA, by the JFSQ or both.

#### **3.2 Additions**

Area of forest available for wood supply (or improve explanation on Total area designated for production)

Area of planted forest available for wood supply

Area of planted forest designated for production (and protection)

Wood removals from planted forests.

#### **3.3 Changes**

Decide whether fellings or removals should be reported upon.

Probably a minor revision of the FRA definition of woodfuel removals

Establish a standard minimum diameter for reporting on growing stock (e.g. 0 cm)

Don't split removals on forest and other wooded land.

#### **3.4 Ideas for thematic studies**

Wood removals

NWFP removals