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## **Outline of work plan for WG1 of COST action E43**

### **Background and objectives**

The goal of the first part of this document is to discuss detailed definitions and measurement or assessment protocols, in order to identify causes of discrepancy between different NFI outputs and discuss of harmonisation. A first rough description of the inventory design is then requested. Afterwards a first draft questionnaire is proposed. It is limited to only three major data or variables, as it is mainly devoted to establishing a framework for the discussion.

### **Main concepts**

For clarity, we suggest to adopt the following terminology :

- an inventory object is an entity addressed by forest inventory, to which attributes are attached; for example, a tree (attributes: age, species, height...), a site or individualised piece of land (attributes: land cover, land use, ownership...), a forest stand (attributes: structure, species composition, growing volume...),
- attributes may be divided into measured data (e.g. tree diameter at breast height), observed data (e.g. tree species), computed data (e.g. tree volume), assessed variables (e.g. site growing volume), the difference between computed data and assessed variables being that the former may be derived from measured data of one object only, as the latter require those of some collection of related objects,
- measured, computed and assessed data or variables are expressed in measurement units, such as meter, hectare, cubic meter...
- observed data are expressed using nomenclatures, such as land use classification, species list...

All underlined issues above need a detailed review, as minor differences in definitions or protocols may lead to major discrepancies in inventory results.

To illustrate this, we will now focus on three basic forest inventory issues: tree, forest and tree standing volume. For each of them, a short questionnaire is proposed. The French NFI answer to all questions is given as an example.

### **The inventory design**

This part might contain a rough description of the main tools used for the inventory design.

This description could serve as a framework for the presentations for the October seminar.

A first list of questions could be the following:

- utilisation of remote sensing and/or aerial photos? For what purposes?
- pinpoint photo-interpretation?
- cartography and forest maps?
- statistical sampling for ground survey: points or plots?
- statistical unit : permanent or temporary?

- forest area estimation : cartographic or statistical?
- number of plots per area unit (e.g. 1000 ha) (or the representative of the plot), when sampling inventory is applied
- the minimum size of the reporting unit (in hectares, e.g. 500 000 ha)
- error estimation method, spatial aspects acknowledged / not acknowledged

## **Main Outputs of WG1**

The main outputs are:

- A report synthesizing current definitions and measurement practices in the NFIs on one hand, and European recommendations and information needs based on international agreements and processes on the other hand.
- A series of studies showing the impact of current practices (statistical design and measurement techniques) on some core variables when compared to harmonised cases if they could be financed.
- A report with recommended (possibly accepted) definitions and measurement practices for the NFIs. The report includes tools and techniques for the generation and provision of harmonised information from individual NFI data, with special emphasis on required meta -information (errors, availability, time and spatial resolution...).

## **Further Outputs and Activities**

The following further outputs are expected :

- Articles in scientific journals and/or reports (case studies comparing current and harmonised parameter estimates, influence of remote sensing material and procedures on parameter accuracy, tools and standards for the provision of harmonised and timely parameters, ...)
- A large conference for NFI data users to promote the idea and use of harmonised and timely information at the European level (scientists, policy, international organisations)

The following activities are expected:

- Synthesis work of specialists in the core work group and MC (work shops, seminars, conferences)
- Pilot studies mainly from younger scientists (national contributions, scientific missions)
- Recognition of existing and elaboration of new measuring techniques and tools for parameter estimation including meta -information (training courses, seminars, scientific missions, joint elaboration of scientific papers)

## **Draft work plan**

A final work plan will be developed jointly and harmonised with the other WGs once the core groups have been established and work started. The draft outlined below is meant to serve as a basis for further discussion and refinement.

Jul-Dec 2004

- Formation of core work group
- Initial interaction with other reports and projects in the field (Guidelines FRA2005, Team of Specialists FAO/UNECE, Kotka IV, EFICS, ...)
- Clarify/Harmonise work plan with WG2 and WG3
- Development and submission of questionnaire

Jan-Jun 2005

- Evaluation of questionnaire
- Review of international recommendations and information needs of international agreements and processes
- Draft report on current definitions and measurement practices compared with international agreements and processes
- Proposal for core variables studies
- Guidelines for impact studies

Jul-Dec 2005

- Compilation of first report
- Initiate pilot studies

Jan-Jun 2006

- Evaluate pilot studies and identify most important and valuable core variables for harmonisation (consider temporal and spatial resolution)
- Initiate work on meta-information needs, techniques and tools for the provision of harmonised parameters

Jul-Dec 2006

- Prepare recommendations and standards for meta-information needs
- Compare NFI design and measurement alternatives (frequencies, permanent and temporary plots, sample sizes, spatial aggregation, ...)

Jan-Jun 2007

- Preparation of conference for NFI data users
- Draft of final report

Jul-Dec 2007

- Conference for NFI data users
- Continue work on final report
- Processing of recommendations in the MC

Jan-Jun 2008

- Compilation of final report

## **PART 2 : draft questionnaire**

The goal of this questionnaire is to discuss detailed definitions and measurement or assessment protocols, in order to identify causes of discrepancy between different NFI outputs and discuss of harmonisation. A first rough description of the inventory design is then requested. Afterwards a first draft questionnaire is proposed. It is limited to only three major data or variables, as it is mainly devoted to establishing a framework for the discussion.

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### **The tree (as an object in forest inventory)**

What is taken into account for growing stock assessment?

n°	Question	Answer (for France)	Comment
1.1	Limited species list?	Yes.	List open for exotic species.
1.2	Morphological condition?	Individualised stem up to 1.30 m at least.	Considered species dependant.
1.3	Potential size condition?	Height > 7 m in natural growth conditions (countrywide average).	Considered species dependant.
1.4	Individual size condition?	Diameter at 1.30 m > 7.5 cm.	Otherwise, regeneration density count (stand attribute) only.
1.5	Conditions for special cases: coppice, forked trees, low branches...	Coppice: one stem = one tree. Forked: two trees if fork below 1.30 m. Low branches: no extra tree.	Distinction between branch and fork from size similarity and inclusion angle of branches.
1.6	Use condition?	Tree mainly devoted to wood production.	Considered land dependant (forest vs. agricultural or urban).
1.7	Vegetation status condition?	Presumed to live one more year at least.	Otherwise, counted as dead tree.
1.8	Other?		

### The forest (as an item in land cover or land use nomenclature)

What is taken into account for forest area assessment?

n°	Question	Answer	Comment
2 1	To what site attribute(s) is forest related?	Primarily to land cover: forest vs. poplar stand, heath, other vegetation, no vegetation, inland water. Secondarily to land use for the distinction of productive forest.	Poplar stands may be merged with forests for international statistics.
2 2	Land unit size condition?	Area > 5 a. Width (on ground) > 25 m.	Area size 50 a also considered for international compliance.
2 3	Crown cover condition?	> 10% of forest trees (see definition above). > 40% for closed forest.	Equivalent tree count condition for young forests.
2 4	Use condition?	Wood production must be the major management issue (or perhaps the second one after hunting).	Otherwise: non-productive forest or trees out of forest (urban, rural).
2 5	Other?		

**The tree standing volume (as an attribute of inventoried tree)**

How is the standing volume computed?

n°	Question	Answer	Comment
3.1	Over or under bark?	Over bark.	
3.2	From what height?	10 cm above ground.	Highest ground contact considered.
3.2	Up to what height?	Stem diameter > 7 cm.	
3.3	Branches considered?	No.	
3.4	Computation scheme and measures?	Complete measurement of 25% trees: decomposition into quadratic or cylindrical logs, lengths and mid or end diameters measured. For others, non-linear regression on diameter at breast height and total height, using data from completely measured trees, according to species, stand structure and composition, ownership and forest region (ecological classification).	
3.5	Other?		

Note. Please feel free to add or reformulate questions if not accurate enough to describe your own data. The questionnaire will be reiterated after finalisation.