



MEMORANDUM OF UNDERSTANDING
for the implementation of a European Concerted Research Action
designated as

COST E43

**"HARMONISATION OF NATIONAL FOREST INVENTORIES IN EUROPE:
TECHNIQUES FOR COMMON REPORTING"**

The Signatories of this Memorandum of Understanding, declaring their common intention to participate in the concerted Action referred to above and described in the Technical Annex to the Memorandum, have reached the following understanding:

1. The Action will be carried out in accordance with the provisions of document COST 400/01 "Rules and Procedures for Implementing COST Actions", the contents of which the Signatories are fully aware of.
2. The main objective of the Action is to improve and harmonise the existing national forest resource inventories in Europe.
3. The economic dimension of the activities carried out under the Action has been estimated, on the basis of information available during the planning of the Action, at Euro 20 million in 2003 prices.
4. The Memorandum of Understanding will take effect on being signed by at least five Signatories.
5. The Memorandum of Understanding will remain in force for a period of four years, calculated from the date of the first meeting of the Management Committee, unless the duration of the Action is modified according to the provisions of Chapter 6 of the document referred to in Point 1 above.



TECHNICAL ANNEX

COST E43**"HARMONISATION OF NATIONAL INVENTORIES IN EUROPE:
TECHNIQUES FOR COMMON REPORTING"****A. BACKGROUND****National forest resource assessments**

The role of forests and forestry varies among European countries. Industrial use of timber is still the main benefit of forests in many European countries, while non-wood goods and services – including protection, recreational aspects and biodiversity – are gaining more importance especially in the urbanised societies.

Traditionally, forest information has been collected through user-driven national forest inventories (NFIs). The NFIs have different history in different countries, some type of information has been gathered in many countries (e.g., Belgium, France, Great Britain) in 19th century, but systematic assessments based on sampling started in 20th century. The Nordic countries began sample-based inventories in 1920's, whereas some countries have begun early in the 1980's or 1990's.

Today, the sampling inventories are carried out in most of the European Union (EU) member countries, however, the tradition in Eastern Europe has been gathering the national data by aggregating stand inventories originally designed for management planning purposes. Many of the Eastern European countries have recently changed their system towards statistically sampling based NFIs.

Needs for harmonised reporting

FAO (Food and Agriculture Organization of the United Nations) has compiled global and UNECE (United Nations Economic Commission for Europe) regional level (Temperate and Boreal Forest Resource Assessment, TBFRA) information from National Forest Inventories since 1950. FAO's Global Forest Resource Assessment (GFR) work is significantly assisted and supported by TBFRA Team of Specialists and UNECE secretariat in Geneva. The Team of Specialists was established in 1994. In the most recent UNECE/FAO assessment, compiled in 2000, special attention was paid to the harmonisation of the variables for the international statistics. The countries were asked to

report the variables according to the commonly agreed FRA definitions, and if they differ from the national ones, report progress to derive the process to achieve FRA variables.

Over the last few decades in Europe, the role of forests and forestry has become broader. The scope of the NFIs has also broadened and new variables for assessment have been introduced. This concerns both the national needs and the needs for common reporting at the international level.

The needs emerge from international conventions and policy processes, such as to Kyoto protocol addressing the climate change. In the framework of Ministerial Conference for Protection the Forests of Europe (MCPFE), the European Countries and the EU have agreed on 35 quantitative indicators, describing the sustainability of the forest management. Many of these indicators originate from NFIs and are reported through FRA.

Consequently, the most recent Global Forest Resource Assessment (FRA2000) included several new variables to meet the new information needs. These new variables have been planned and defined in expert level meetings organised by FAO and UNECE. FRA2000 was the first assessment to use a homogeneous set of global definitions and it is, to date, the most comprehensive assessment of the global forest resources. Yet, the FRA2000 report indicates severe problems in harmonisation of some variables, such as definitions for natural forests (no human intervention), forest available for wood supply or forest area by protection categories. Also, implementing the harmonised definition of base line variables (e.g. forest) in practical data collection has been found to be problematical.

At the European level the ICP Forests (International Co-operative Programme on assessment and monitoring of air pollution effects on Forests) has been carried out by NFIs or at least has been closely linked to NFIs. Continuing and widening of the ICP Forests in the framework of Forest Focus is under discussion at the moment. In all countries, seeking synergies between Forest Focus and NFI is an issue for ensuring coordinated and cost effective assessment of forest status.

In order to be able to respond to the needs of harmonised information at European level, representatives of European National Forest Inventories have established an informal network called ENFIN – European National Forest Inventory Network.

Relevant research and development carried out

The EU Council regulation (EEC) No 1615/89 extended by Council Regulation (EEC) No 400/94 established a European Forestry Information and Communication System (EFICS). The objective of EFICS was to collect comparable and objective information on the structure and operation of the forestry sector in the Community. Within this context, the Commission entrusted the European Forest Institute (EFI) in 1996 with a planning task with having the overall aim of analysing in detail the statistical sources of forestry resources in the Member States. The EFICS study produced detailed information on differences between NFIs in EU countries and

some other countries in Europe (Study on European Forestry Information and Communication System - Reports on forestry inventory and survey systems, Volumes 1 and 2. European Communities 1997, Luxembourg).

It was found that there is a set of key variables of interest to all stakeholders, and with not all of them being sufficiently harmonised between the NFIs in European countries. The findings of EFICS study provide a good baseline for this COST Action. Further, the study has been followed by a developing a prototype of a European Forest Information System for EC JRC (Contract No 17186-2000-12 F1ED ISP FI), aiming at resource discovery and data presentation.

A significant number of European countries participated project FAIR CT98 4045 'Scale Dependent Monitoring of Non-Timber Forest Resource based on Indicators assessed in Various Scale'. The project identified a number of characteristics and indicators which are suitable over different ecological zones. A part of those groups participate this Action. Large area harmonised forest resource information are presented in the report of the 'Bionord' project, funded by the Nordic Council of Ministers.

COST Actions E4 "Forest Reserves Research Network" and E27 "Protected Forests in Europe – analysis and harmonisation" have provided valuable information for improving the harmonisation of protection categories in close cooperation with the TBFRA national correspondents. These results have been utilised in the context of Ministerial Conference on the Protection of Forest in Europe (MCPFE).

Motivation of the Action

In Europe, there are two NFI approaches, based on sampling or complete stand assessments. There is clear evidence that these two designs tend to give different results. The EFICS study did not cover the new EU member states, which means that the harmonisation needs at European level are most likely to be more demanding than those assessed in that study.

Since EFICS, the information needs on forests and the scope of forest inventories have widened. Currently, one of the most important tasks of NFIs, in addition to plan national forestry and to assess its sustainability, is to produce information on carbon balance of forests. The level of harmonisation in measurement and estimation procedures related to carbon balance is very low. The example of carbon balance reporting emphasises that there is a need for an international forum where European NFIs can react on new information needs, discuss and further develop scientifically sound estimation procedures and definitions related to both traditional and new variables. Another topical issue is still the question related to measuring and monitoring biodiversity in such a way the results are comparable over many countries.

The emerging techniques – various types of earth observation data, airborne or from satellites, or automatic ground observation devices – bring potentials for improving the cost effectiveness of NFIs. These techniques have been adopted with different

schedules and with different modifications. There is evidence that the emerging techniques will produce differences in measurement practices rather than add to the level of harmonisation.

The motivation of this COST Action lies with these facts – new harmonised information is frequently required, new technologies emerge for assessment, and work is carried out by national institutes independently from each other.

Possible complementary with ongoing and planned research

The above mentioned ongoing COST Action E27 “Protected Forests in Europe – analysis and harmonisation” will improve the harmonisation level of protection categories and, possibly, the definition for natural forests, which are important elements of sustainable forestry. The experiences of the Action E27 may be used in planning the work of this Action. Yet, it should be noted that the Action E27 was very closely related to MCPFE process, where as this Action will have the wider scope of NFI data uses and users.

The ongoing COST Action E21 “Contributing of forests and forestry to mitigate greenhouse effect” aims at developing commonly agreed carbon accounting strategy. The Action E21 “requires input data from forest inventories, forest management practices, perspectives of use of forestry products and socio-economics”. This Action will support the basis of the Action E21 through improving the quality of input data from forest inventories. The experiences of the Action E21 in using different methods for carbon balance estimation will be utilised in this Action when giving recommendations for estimation procedures in NFI based reporting.

B. OBJECTIVES AND BENEFITS

The main objective of the Action is to improve and harmonise the existing national forest resource inventories in Europe.

The secondary objectives are to support new inventories in such a way that inventories will meet national, European and global level requirements in supplying up-to-date, harmonised and transparent forest resource information, and to promote the use of scientifically sound and validated methods in forest inventory designs, data collection and data analysis. The Working Groups of the Action will collect and distribute information in currently applied definitions, measurement practices and methods to improve the dialogue between NFIs on one hand and between NFIs and NFI data users on the other, and to promote the use of harmonised definitions, measurement practices and scientifically sound methods.

The ultimate goal is to build up the forestry information services on the national level inventories in order to get maximised benefits from inventories and maximised advantage of local knowledge and requirements together with international requirements. The goal is also to maximise the synergy between NFIs and European and global level processes and policies that require forestry information.

The main benefits of the Action are:

- improved quality of European level forest resource and forest environment data
- improved ability of the NFIs to meet both national requirements for forest information and needs for harmonised and up-to-date forest information at European and international level
- provide input to the future Forest Focus activities
- a forum for sharing experiences and new ideas, ensuring continuous improvement of the NFIs will be established and maintained
- a clearly visible option for the provision of harmonised European forest information, through active and open dialogue with key organisations and openness to new requirements on forest data for emerging policy needs should result

The Action supports the UNECE, Forest Focus and MCPFE, activities, especially Vienna Resolution 4 and 5, where there is a strong reference to improve and harmonise existing forest assessment and monitoring systems. NFIs build the basis of information for Pan-European Indicators for Sustainable Forest Management. The harmonisation process of this Action therefore supports the aims of MCPFE.

The Action provide a feedback and discussion forum for global level forest inventory systems or data users, such as FAO/FRA and UNFCCC (United Nations Framework Convention on Climate Change).

C. SCIENTIFIC PROGRAMME

To achieve its objectives, the Action will

- establish and maintain a forum for sharing experiences and new ideas, ensuring continuous improvement of the NFIs
- work actively with harmonisation issues, in order to provide a core set of harmonised forest variables at regular intervals
- cooperate within different projects for scientific development work within the field of data acquisition for sustainable multi-functional forestry
- promote active and open dialogue with key organisations and openness to new requirements on forest data for emerging policy needs
- assess methods for reporting and supplying comparable European level forest resource information
- identify research needs for joint projects within the EU Framework Programmes and regional (as SNS) and national funding.

The work in this Action is divided into three working groups (WG) as described below.

WG1: Harmonised definitions and measuring practices

The main task of the WG1 is to give operative guidelines for interpretation of existing definitions and find recommendations on new definitions and measuring practices to be applied in NFIs, which will form the crucial part of NFI methodology.

The first step is a review of the current practices and definitions applied in NFIs in participating countries and their differences from international recommendations. As a second step, a core set of variables requiring harmonised definitions and measuring practices will be identified. Information needs of international agreements and processes, such as FAO/FRA, UNFCCC, Biodiversity agreement and MCPFE will be taken into account in selecting the core variables. The WG1 will produce recommendations on measurement practices and definitions to be applied in NFI's.

The recommendations will be processed in the Management Committee (MC) meetings of the Action and, if agreed, adopted to NFIs. Within this WG, inventory designs, e.g. sampling based inventory vs. stand level inventory and inventory frequencies will be considered.

One output of the WG will be a report showing the differences in the current practices, and also their impact on some core forest resource parameters when compared to the harmonised case, i.e., a kind of sensitivity analysis. The report will be presented in a conference targeted to NFI data users. Tools to get harmonised and comparable forest resource estimates will be presented.

WG2: Harmonised estimation procedures for carbon pools and carbon pool changes

The WG2 will focus on the definitions and measurements of those inventory variables that are related to the estimation of forest carbon pools and changes in carbon pools. The Action will interact with IPCC work. All the five pools, above-ground biomass, below-ground biomass, litter, dead wood and soil organic carbon are considered. Examples of key variables are those related to estimating tree stem volume, whole tree biomass, soil carbon, dead wood volume and their changes. One goal is to exchange experiences and information in finding cost efficient methods and solutions when estimating the variables in question. The goal is also to find methods to assess the reliability of estimates.

The output of WG2 is a description of the current methods in different countries, the differences in definitions and measurements in carbon pools related variables and in reporting practices. Methods to get comparable estimates will be elaborated and presented.

WG3: Harmonised indicators and estimation procedures for assessing components of biodiversity with NFI data

The main task of WG3 is to identify possibilities of measuring components of biodiversity in the context of large area forest inventories in such a way that the results are comparable over vegetation zones. Biodiversity is commonly divided into genetic, species and ecosystem diversity as well as functional diversity. It is obvious that only part of the characteristics describing these concepts can be measured in the context of large area forest inventories. Indicators and surrogates must be applied. The existing forest inventories have, however, an advantage in that they already provide information from the key components of forest ecosystems, such as the growing stock of trees, soil, ground vegetation, and, in some cases, spatial arrangements of the ecosystems, e.g., when utilising remote sensing data. It is also commonly agreed that components of the biodiversity can be measured in the most efficient way in the context of large area forest inventories.

The key components by ecosystems and vegetation zones will be identified. Harmonised definitions and measurement practices will be sought.

The output of the WG is a list of practical variables, indicators and surrogates describing forest biodiversity (linked to MCPFE Criteria & Indicators of sustainable forestry), together with the current status in assessments in participating countries.

D. ORGANISATION

The Action will be lead by Management Committee (MC). The members of the existing ENFIN group will probably actively participate in the work of the MC. UNECE will be invited as an observer for the MC meetings.

The MC will monitor the progress of the Action, process recommendations and findings of the Working Groups, and finally give recommendations for NFIs. The MC of the Action will decide, within the budget, on Short Term Scientific Missions (STSM).

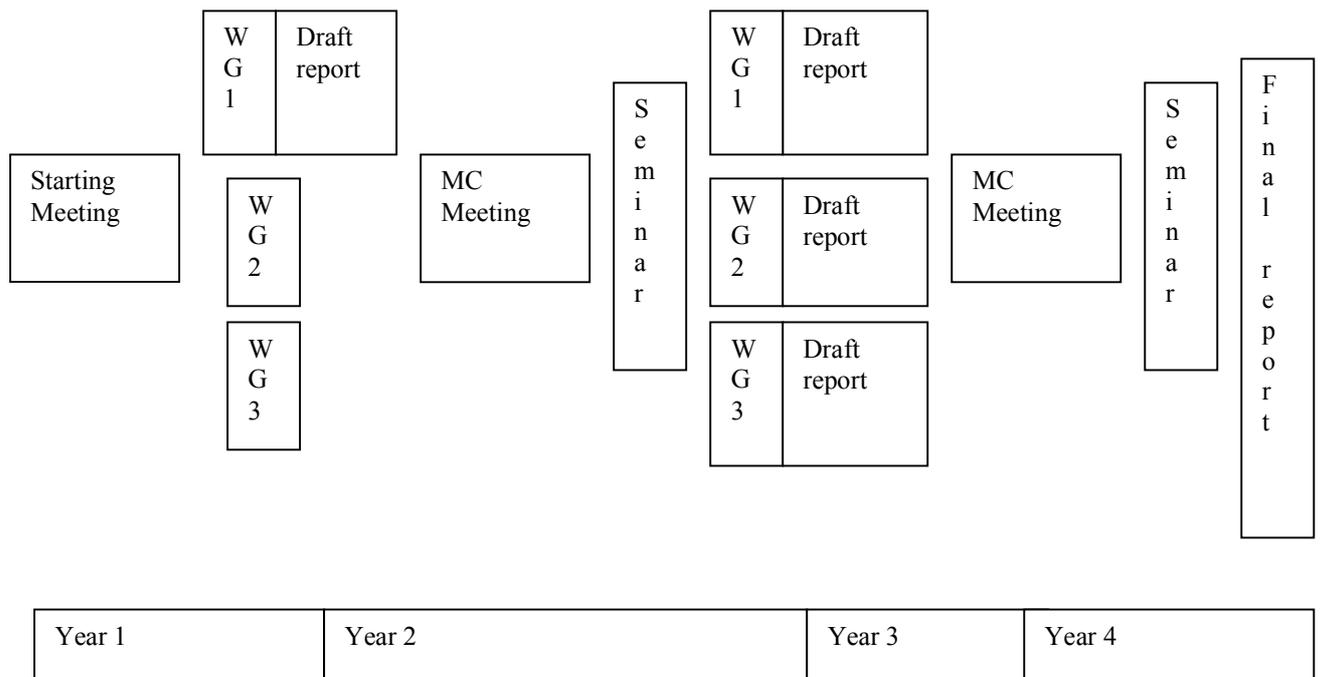
As described above, the actual work is done in Working Groups and possibly partly through Short Term Scientific Missions. Each Working Group will elect a chairperson responsible for progress of the WG. Working Groups will hold separate meetings, once or twice per year. These meetings will process the scientific work related to the title of the Working Group, done by individual participating members. When applicable, experts outside the Action will be invited in these meetings.

Cooperation with NFI related processes (such as ICP Forests, MCPFE, FRA, TBFRA) and/or organisations (such as FAO, UNECE, Eurostat) will be ensured by inviting their experts as observers in the MC meetings and/or as specialists in the WG meetings. The experts of COST Action E21 will be invited to participate the WG2 to ensure that their findings on improving the IPCC (Intergovernmental Panel on Climate Change) guidelines for monitoring (terrestrial) carbon pools will be utilised in this Action. Correspondingly, co-operation with the COST Action E27 will be organised to fully utilise their expertise and recommendations on classifying protected forests and assessment the naturalness of forests.

E. TIMETABLE

The duration of the Action is 4 years. The tentative timetable is given below. During the first year the WG1 will review the currently applied definitions and practices through WG meetings and possibly Short Term Scientific Missions. The progress of the WGs will be followed by the MC and processed in a MC meeting. By the middle of the second year the report on findings of WG1 will be completed and presented in a seminar targeted to NFI data users. After the seminar, the WG1 will continue it's work to give recommendations on harmonised definitions and measurement practices for NFIs. WG2 and WG3 will work on carbon and biodiversity issues, respectively. All the WGs will draft a final report by the end of third year. The drafted reports will be processed in a MC meeting and presented in a large seminar. The WG reports and conclusions from the seminar will be gathered in a final report of the Action by the end of year 4.

Timeplan



F. ECONOMIC DIMENSION

The following COST countries have actively participated in the preparation of the Action and clearly expressed their interest and will participate in the Action:

Austria, Belgium, Czech Republic, Denmark, Estonia, Finland, France, Germany, Hungary, Ireland, Italy, Latvia, Lithuania, Norway, Poland, Slovenia, Spain, Sweden, Switzerland, United Kingdom.

On the basis of national estimates provided by the representative of these countries, the economic dimension of the activities to be carried out under the Action has been estimated, in 2003 prices, at roughly Euro 20 million.

This estimate is valid under the assumption that all the countries mentioned above no other countries will participate in the Action. Any departure from this will change the economic dimension accordingly.

G. DISSEMINATION PLAN

The target audiences for the dissemination of the results are:

- European and global processes (MCPFE, IPF, IPCC, UNFCCC, UNFF, Forest Focus) and organisations (FAO, UNECE, Eurostat, EFI) using and compiling forest resource statistics and information,
- national NFI data users, such as policy makers, forest industry, and research organisations,
- NFI teams in countries participating in the Action and other countries as well.

Following tools will be used for dissemination:

publications of main findings and results. The first expected publication will be a report describing and analysing current definitions and measurement practices in different countries (WG1). Another publication will be the final report of the Action containing recommendations on harmonised definitions and estimation procedures related to the selected key variables. In addition to these two publications, some of the results of the Short Term Scientific Missions may be published as scientific articles in relevant international journals.

each Short Term Scientific Mission will produce a report that will be available through the web site of the Action. As mentioned, some of the reports may be published as scientific articles

conferences and seminars. At minimum, two conferences targeted at organisations and processes using NFI data as well as NFI specialists will be organised. The first one will be following the completion of the report of WG1 (12 – 18 months after starting the Action), the last one at the end of the Action. It is expected that there will be a number of other relevant seminars and symposia organised outside this Action where the specialists of this Action may participate and present the findings of the harmonisation work.

a web site will be established for both internal (within the Action) and external information dissemination. This web site will contain, among others, the documents processed in the WG and MC meetings. The second target audience mentioned above (national NFI data users) is very large. For them, especially, a web site will be the most suitable tool for providing up to date information on findings and results of the Action. The web site will serve also as a contact point to individual NFIs.

In addition to the above listed formal tools for information dissemination, the COST Action will serve as link and contact point to NFIs outside Europe and countries that are not participating this Action.

Additional Information

Title of the Action:

E43 2Harmonisation of National Forest Inventories in Europe: Techniques for Common Reporting”

Proposing country: **Finland**

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History of the network

In June 2003, representatives of National Forest Inventory organisations from 18 European countries, FAO FRA Team, UNECE TBFRA Team, European Environment Agency, IUFRO, ICP-Forest, and European Forest Institute held a meeting. In this meeting, an informal network of European NFIs (ENFIN) was established. It was further decided that a COST Action should be established to facilitate and organise the work of the network. An interim steering group was established in order to set up the organisation and initiate the COST Action. The chairperson of the group is Dr. Klemens Schadauer (Austria) and deputy chairperson prof. Göran Ståhl (Sweden). The members of the working group are Anne-Marie Bastrup-Birk (Denmark), Andrius Kuliesis (Lithuania), Marco Marchetti (Italy), Risto Päivinen (European Forest Institute), Klemens Schadauer (Austria), Steve Smith (United Kingdom), Göran Ståhl (Sweden), and Erkki Tomppo (Finland).

List of Experts

Following persons attended the first ENFIN meeting in Vienna or have expressed interest in participating the ENFIN work and the Action:

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