



- Basis for national policy and strategic planning

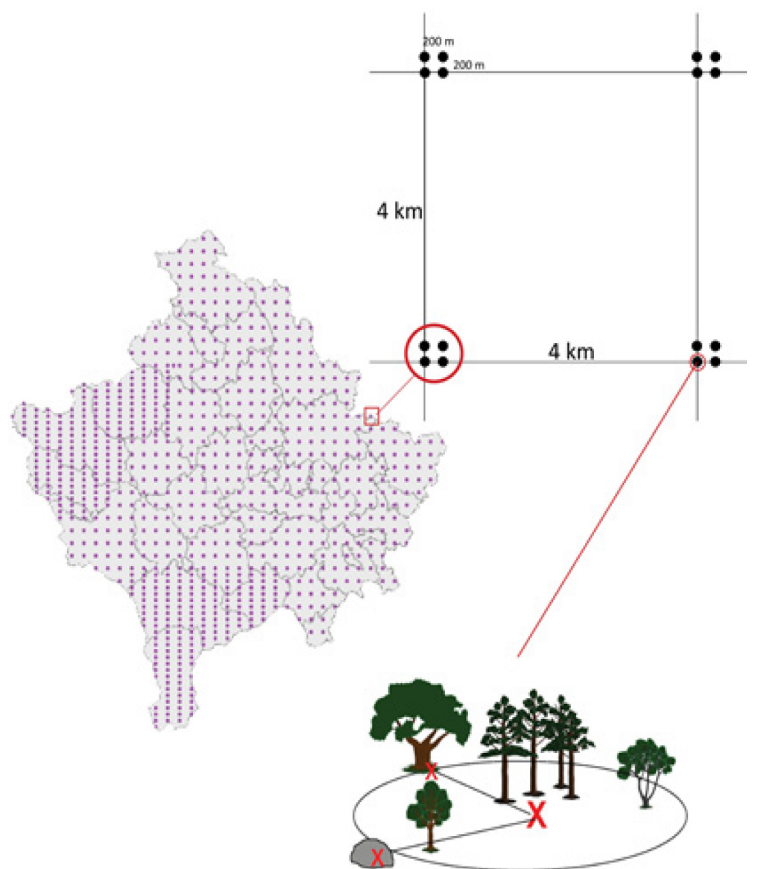
In order to ascertain efficient use of resources and sustainable forest management, most countries with a significant forest area have established a National Forest Inventory. Modern NFIs normally provide a wide range of information about a country's forests, related to timber, carbon stocks, vegetation, habitats, protection etc., complying with international reporting requirements. Norwegian Forestry Group provides services in planning, training of personnel and implementation of such inventories, based on a combination of long-term experience and current research and development.

Objectives

Traditionally the purpose of National Forest Inventories (NFIs) has been to provide continuous information on the state of a given nation's forest resources, including timber volume, species composition and sustainable development. But with increased international reporting requirements – to FAO, United Nations Framework Convention on Climate Change (UNFCCC), Kyoto Protocol, Ministerial Conference on the Protection of Forests in Europe (FOREST EUROPE) and other international bodies – the role of NFIs in responding to these requirements has received considerable attention.

Target groups

Primarily government, central and regional forest administrations, forest policy officers, forestry associations, other forestry professionals, forest industries, environmentalists and nature conservationists. Also educational institutions and the general public.



Example of sampling design for National Forest Inventory

Knowledge transfer and training

During all of our assignments, we involve the local people as much as possible in the execution of an inventory. This is to enable knowledge transfer and training and to secure the sustainability, use and quality of the output. It is important to adjust to local conditions and to develop methodology and products in cooperation with the end user.



Various international forest reporting is to a large extent based on data from National Forest Inventories.

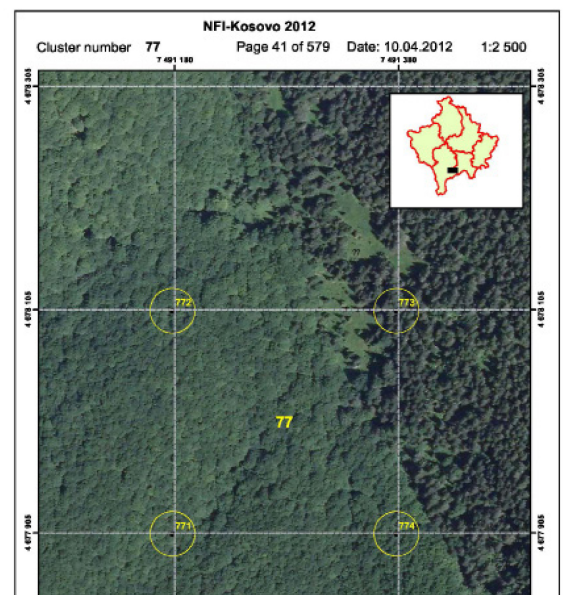
Background

Systematic national forest inventories started in the Nordic countries around 1920. Accurate, up-to-date information about the size, distribution, composition and condition of the forests and woodlands is essential for developing and monitoring policies and guidance to support their sustainable management. To gather this information and keep it up to date, a national institution is normally responsible for carrying out periodic surveys across the country. This institution should, after the period of introduction and establishment, be responsible for the following tasks:

- Create an overall plan and budget for the NFI work
- Prepare detailed instructions for the various tasks under the NFI, e.g. the fieldwork
- Carry out necessary operations, like photo interpretation, production of maps and fieldwork
- Quality control of data
- Calculation of secondary variables, as growing stock, carbon stock and annual increment
- Analysis and publication of results
- Management of database
- Be able to respond to requests for data, e.g. from international bodies.

Methodology

Compilation of data from stand-wise inventories has been a common practice in countries with centrally planned economies. A regular updating of management plans for the forest area made this practice feasible. However, when a sampling based inventory has been implemented, it is very often found that the former practice underestimated the forest resources. Also, some data, as detailed information on increment, mortality, harvesting etc. are normally not available from stand-wise inventories.



Orthophoto with sample plot locations

Previous inventories were often using temporary sample plots, now more and more countries have turned into a practice with permanent sample plots. These are plots that are being remeasured at regular intervals, commonly every 5 years. This is today the most common method in European countries.

This method makes it possible to track land-use changes (essential for carbon reporting), to estimate annual increment accurately without increment boring and to obtain data for natural mortality and harvested trees. Besides, the data may be used for specific purposes, such as growth and yield studies.

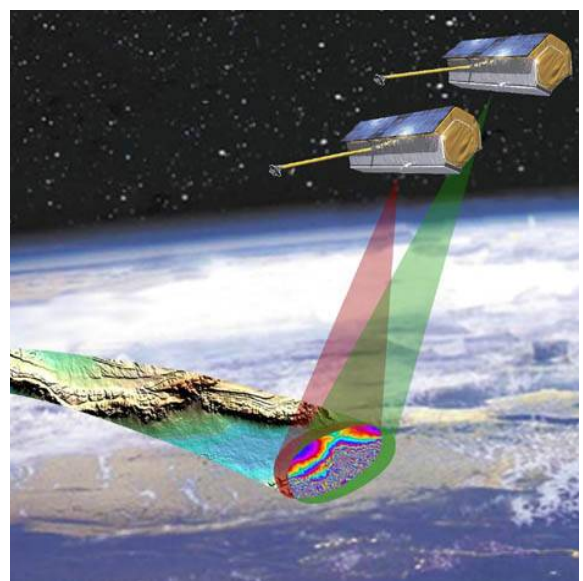


Accurate measurement of tree diameter is important for the data quality

The number, shape and size of sample plots vary considerably among NFIs. Circular plots, often with multiple concentric components, are used by more than 90% of NFIs, although square and rectangular plots are used, as are transect and angle count sampling. Some NFIs use a mixture of plot shapes and transects depending upon the variables measured. The diversity of plot sizes and shapes and sampling approaches has increased recently to accommodate the need for more diverse forest information. NFIs whose sole objectives previously related to estimation of timber resources have given way to NFIs that encompass a host of outputs including ground vegetation, deadwood, biodiversity and soil information, in addition to timber information.

Remote sensing

Many NFIs are also to some extent based on remote sensing methods. The most common of these is an interpretation of plot locations on aerial photographs prior to the fieldwork, to select those plots that are necessary to visit in the field. Such interpretation can also be used to obtain some information on inaccessible forest areas. Satellite data may, under certain conditions, be used for stratification or for producing geographically localized information for areas smaller than is possible using field data only (“multi-source inventory”).



The TanDEM-X satellite mission is being tested for forest surveys

A number of new methods, potentially useful as supplements to the NFI, are under development, e.g. airborne laser scanning, digital stereo image matching and radar techniques. NFG partners are actively involved in this development work.

References and previous projects

Assistance to development of NFI in Kosovo, 2002-2003 and 2012-2013

Assistance to development of NFI in Serbia, 2004-2005

See also www.nfg.no

NFG Lead Partner Norwegian Forest and Landscape Institute is responsible for the implementation of the Norwegian NFI, which has been operational for almost 100 years. The institute has had long-term international cooperation within the fields of NFI methodology, forest resources assessments and carbon reporting. That also includes the obligation to report forest-related information to international bodies.

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