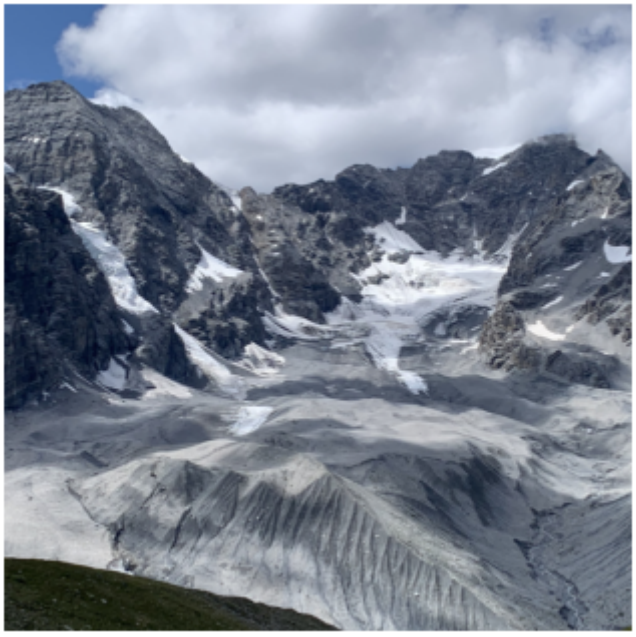
Project LIFE MAN FOR C.BD

Managing forests for multiple purposes: carbon, biodiversity and socio-economic wellbeing

climate change | carbon cycle | carbon emissions | mitigation

PROJECT DESCRIPTION



The European forestry sector is characterized by great diversity in terms of types of forests, extent of covered surfaces, ownership structures and socio-economic conditions. According to "The State of Europe's Forests" (FOREST EUROPE, 2015), European forests have an extension of 215 million hectares, meaning approximately 33% of the total European area. Forests play a crucial role from different points of view, not only in terms of procurement of timber and other forest products, but also with respect to the supply of ecological and environmental services such as water regulation, fight against erosion, carbon storage, safeguarding of biodiversity, as well as recreational services.

Starting from the 70s the management of publicly owned forests (but also of a part of privately owned ones) has changed from a production-based model (timber and firewood) to less intensive practices, both because of the reduction of profits from traditional forestry practices, and due to the emerging awareness about the environmental functions of forests. In addition, since the 1990s, the protective role and the carbon storage function of the managed forests have become increasingly important. In order to preserve the multifunctional role of forests, managers, owners and public administrations are called upon to define management plans that take into account the different aspects and functions, including emerging ones, of the forest areas.

On the other hand, there is a low level of awareness among technical experts, stakeholders and public opinion about the need for new criteria for sustainable forest management and the general difficulty of changing national and regional forest regulations in the short term. The conditions described highlight the need for the spreading of forestry practices more functional to the desired balance between productivity and forest conservation, biodiversity and carbon sequestration.

In this context, a political process has been developed at European level since 1990, through the Ministerial Conference on the Protection of Forests in Europe - MCPFE - FOREST EUROPE) aimed at defining proposals and actions towards sustainable management. Among the most relevant activities of the MCPFE there is the development and definition of a **set of Pan-European indicators for sustainable forest management**, referable to **6 specific criteria** that provide a guide for the development of policies and support for the evaluation of the progress of the performed activities.

OBJECTIVES

The Manfor C.BD project focused on the application and verification in the field of the effectiveness of different multi-objective forest management options (production, protection, biodiversity, etc.), providing data, addresses and indications about good forestry practices. In particular, the data relating to the main Pan-European indicators adopted by the MCPFE (notably the

indicators relating to the carbon cycle/ sequestration and biodiversity - Criteria from 1 to 4) have been collected and further indicators have been developed and tested (Figure 1). The central element of the project philosophy was to aim at **improving the multi-functionality of forests** in terms of eco-systemic services (notably carbon sequestration and biodiversity) **without compromising quality wood production.**

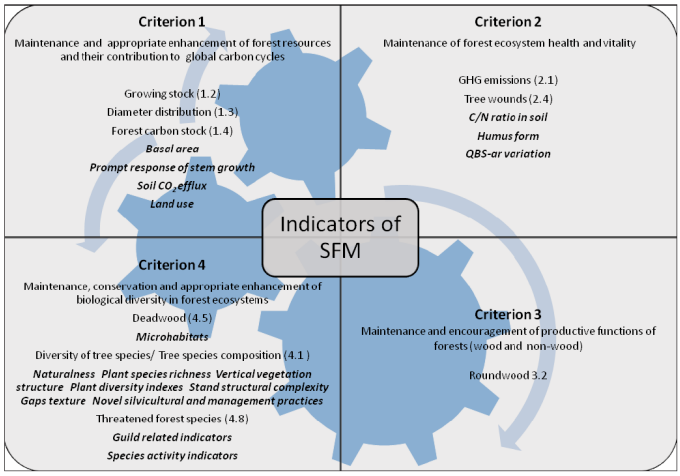


Figure 1. Traditional indicators (developed by MCPFE, identified by the numbering) and new indicators (in bold) analyzed and tested in the context of the project for each chosen forest management criterion (1-4) (Source: E. D'Andrea et al . - "Data collection and new indicators of sustainable forest management: the Life project ManFor C.BD", Annals of Silvicultural Research, 40 (1), 2016: 52-54).

PROJECT PHASES

The main objectives set by the MAN FOR C.BD project with reference to each of the identified test areas, were to:

- propose and implement multi-objective forest management options;
- evaluate the effective applicability of the identified options;
- compare innovative or new management options with those traditionally used in the area;
- select the optimal approaches and promote their application;
- provide data on already available Sustainable Forest Management Indicators and propose new ones;
- disseminate the results of the project at different levels: from scientific to political-decision-making, up to the general public.

In order to achieve the above objectives, the following phases and activities were developed during the project:

- preparatory phase: analysis and selection of the target species and ecosystems as well as the test areas of the project, definition of the project's action plan (including sampling protocols), preliminary selection of the sustainable forest management indicators relating to the carbon cycle and biodiversity (see final list in Figure 1) and assessment of the impacts of the project activities with respect to the Natura 2000 conservation objectives. The selected sites, 7 in Italy and 3 in Slovenia, were: Cansiglio forest (Veneto region), Chiarano Sparvera (Abruzzo region), Lorenzago di Cadore (Veneto region), Mongiana (Calabria region), Pennataro - Monte di Mezzo (Molise region), Tarvisio (Friuli Venezia Giulia region) , Vallombrosa (Tuscany Region), Kocevski Rog (Slovenia), Sneznik (Slovenia) and Trnovo (Slovenia). In Italy, beech, spruce, mixed spruce-larch, and oak woods were chosen, while in Slovenia mixed beech-white fir and spruce woods.
- **mapping** of the 10 test areas of the project with evaluation of the landscape models and the ecological connectivity of the areas with the nearby ecosystems/ landscapes. The *ex-ante* conditions and the potential impacts of the project's forest management actions, as well as the representativeness of the chosen areas were assessed, using remote sensing and mapping techniques.
- **analysis and definition** of forest management options: this phase involved a first analysis of the quality of the "traditional" management strategies and the **identification of the parameters** to be measured and evaluated for the purpose of verifying the effects on carbon cycle and biodiversity; subsequently new forest management options were defined, which were then applied and monitored in the test areas. Notably, the envisaged traditional site management interventions were accompanied by one or two (**site-specific) management options** proposed by the Project. These options, without neglecting the productive purposes, were aimed at the optimisation of the forest management in terms of:
    - climate change mitigation, by removing CO_2 from the atmosphere;

- biodiversity conservation;
- increase in the structural complexity of the forest;
- quality of the wood products also with respect to their durability (a beam holds the carbon for centuries, playing a lasting ecological role, the firewood returns it to the atmosphere in a short time).

Measurements are taken before and after the interventions to ensure the possibility of a reliable comparison between the various proposed management options. For example, among the "innovative" options applied to the Italian test sites the following can be mentioned:

- **Cansiglio forest**: identification of a non-pre-established number of well-formed scattered trees (generally in the predominant-dominant social classes) and thinning of the foliage of the competing plants in order to promote future growth capacity at the crown, trunk and roots of the selected plants. Due to structural similarity, the same intervention was planned in the Vallombrosa forest, which however was not carried out due to occurred wind storms;
- **Chiarano forest**: preliminary selection of a number of well-formed plants between 40 and 80 units per hectare (based on the development of the crown and trunk) and cutting of all the surrounding plants in competition;
- **Lorenzago di Cadore forest**: collection of some mature trees and contemporary thinning of intermediate size plants collected in small groups. This strategy makes possible the minimum mechanization of the collection;
- **Mongiana forest**: identification of 45-50 plants per hectare (so-called "candidate plants") and removal of the plants in direct competition;
- **Pennattaro forest**: implementation of two options – one aimed at the maintenance of the typical structure and composition of the oak wood and the other at addressing the natural evolution towards a mixed forest;
- **Tarvisio forest**: comparative assessments of the use of thinning machinery (different levels of mechanization);
- **assessment of the indicators** relating to the carbon cycle and biodiversity in sustainably managed forests. In particular, the impacts of the various forestry practices on the indicators related to carbon in the forest ecosystem were assessed using different methodologies and, as regards biodiversity, the effects of forest management on the structural diversity, diversity in plants and in fauna (vertebrates and invertebrates) and on the quantity of dead wood were assessed;
- **preparation of demonstration areas** (within 9 of the 10 test areas) in order to increase public awareness on forest management.

PROJECT RESULTS

The ManFor C.BD project was mainly oriented towards the definition of the best practices for multi-objective forest management, which were reported in the **Manual** "*From the experience of LIFE+ Manfor C.BD to the Manual of Best Practices in Sustainable Forest Management*" (*Italian Journal of Agronomy*). An additional **Manual** dedicated to forest management experiences in the Veneto Alps has also been drafted.

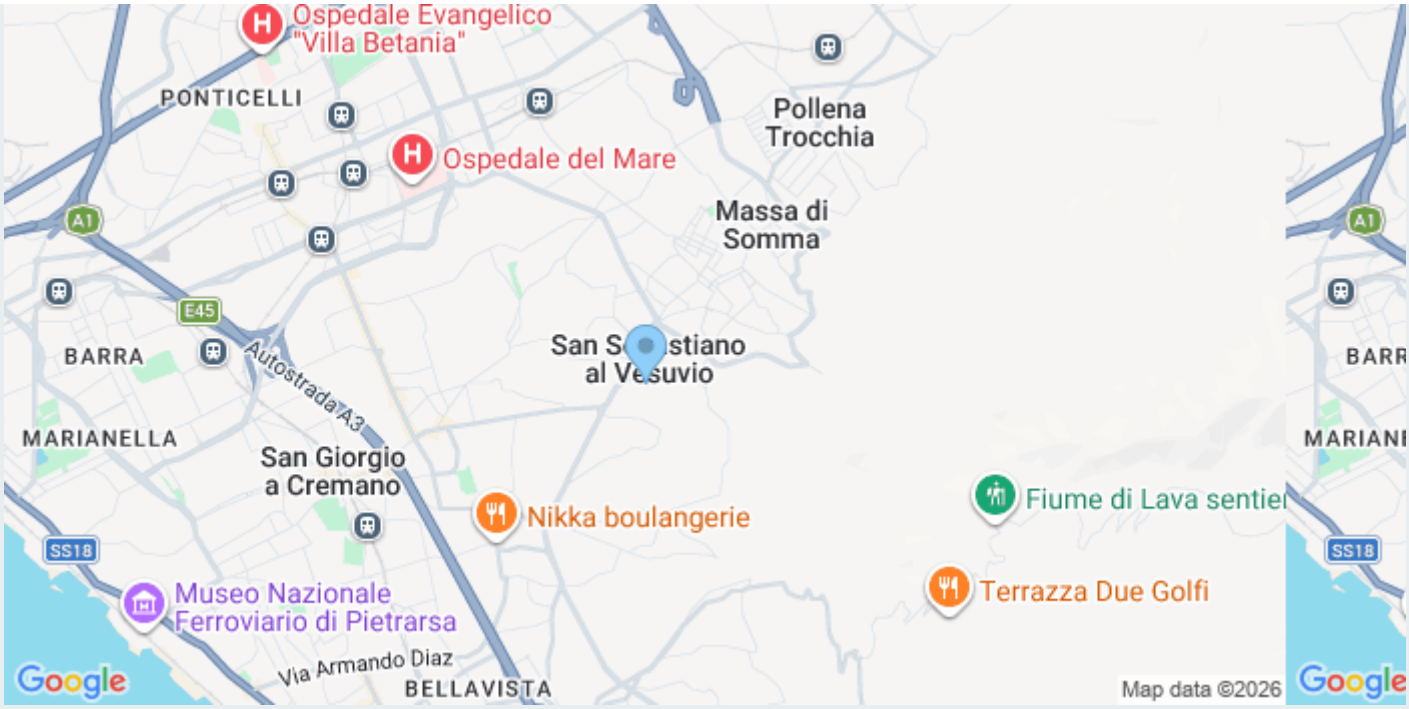
From the analysis of the developed best practices the following lessons can be learnt:

- the involvement of multidisciplinary skills in forest management, strating from its planning, produces the best possible compromise between different types of forestry interests (biodiversity, carbon storage, productivity, etc.);
- the definition of small-medium scale wooded areas to be managed, favors structural diversity, that influences biodiversity, resilience and the landscape;
- thinning from above can be applied even in mountain forests (beech woods) in order to favor candidate plants, obtaining thicker trunks and of greater economic value as well as a longer duration of the final products;
- zonal forest management, together with a less "regular" application of thinning, promotes animal and plant diversity;
- the use of machinery in forests can be compatible with the principles of sustainable forest management;
- local communication and dissemination significantly increases awareness on forest management and acceptance of forest practices;
- deadwood really increases the biodiversity in the forests and can be regulated in different forest contexts also by mixing different types of deadwood;
- harvested tree stumps often represent a neglected component of deadwood.

Further achievements of the project were:

- the definition and evaluation of **17 new indicators for Sustainable Forest Management** (one relating to forest management options, 2 to soil variability, 3 to forest structure, 3 to the carbon cycle and 8 to the diversity in vegetation and fauna), reported in the **Manual on sustainable forest management indicators.** In order to assess the sustainability of the various forest management options, **9 Pan European indicators (defined by the MCPFE) were also analyzed**;
- creation of **9 demonstration areas:** 6 with specific paths and noticeboards (from 10 to 14) and 3 where the fundamental results and maps of the areas were exposed. At the closing date of the project, the areas had been visited by about 2000

people.



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Acronym
LIFE MAN FOR C.BD

Number of reference
LIFE09 ENV/IT/000078

Reference Programme
LIFE

Beneficiary Coordinator
Consiglio nazionale delle ricerche - ISAFOM

Contacts
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EU contribution
2.483.271

Call Year
2009

Start Year
2010

End Year
2016

Beneficiary headquarters

Via Patacca, 85
80056 Ercolano NA
Italy

Region
Veneto

Description

Italia (Regioni Veneto, Friuli-Venezia Giulia, Toscana, Lazio, Abruzzo, Molise e Calabria) – Slovenia (Notranjsko-kraska, Goriska, Jugovzhodna Slovenija)