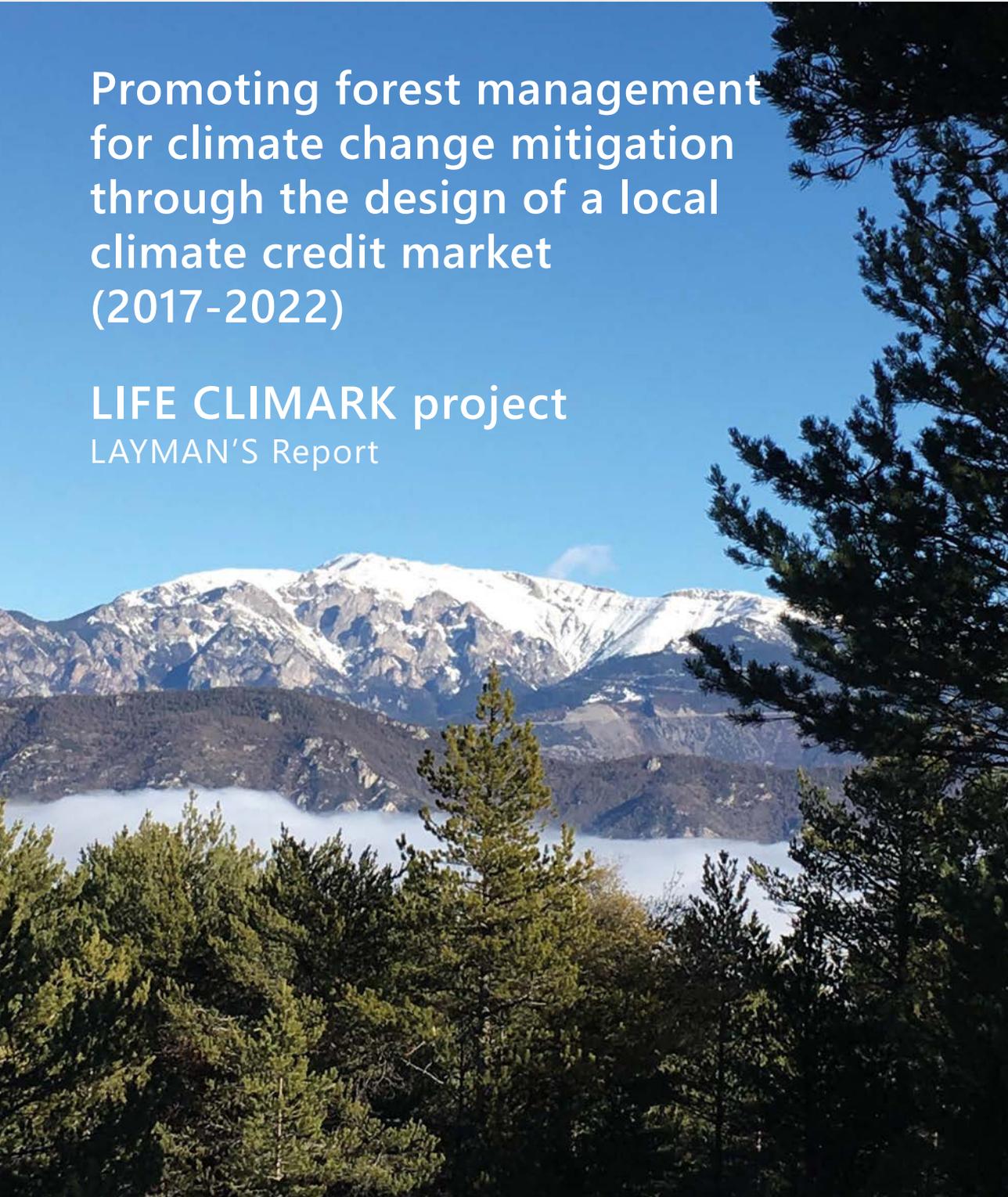




Promoting forest management for climate change mitigation through the design of a local climate credit market (2017-2022)

LIFE CLIMARK project
LAYMAN'S Report





www.lifeclimark.es



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Background: Forests and climate change

“ Forests contribute to climate change mitigation but this role is at risk. ”

The great forest expansion experienced in Europe during the second half of the last century has contributed to the sequestration of atmospheric carbon dioxide, which has been stored in the form of carbon in trees and forest soils. In the last 25 years, forest biomass in Catalonia has increased by 73% and forests are 24% denser now than in 1990. Today, however, the role of forests in climate change mitigation is at risk: in Catalonia, the rate of CO₂ sequestration has decreased by 17% over the last 25 years and the increase in the amount and intensity of natural disturbances threatens stocks that have built up over decades.

These changes in the structure of the forest, combined with climate change, have damaged the health of forests, increased the risk of fires and affected the provision of basic services such as water, contributing to the 30% reduction in flow that Catalan rivers have been suffering for the last 25 years (FORESTime, 2020). Biodiversity has also been affected by forest expansion, especially biodiversity linked to scrub and open spaces. In the last 20 years, the populations of birds and butterflies associated with these environments have been reduced by 14% and 57% respectively (State of Nature in Catalonia, 2020).



AIMS

The main aim of the CLIMARK project is to **contribute to mitigation of and adaptation to climate change promoting the multifunctional management of Mediterranean forests** by means of a new instrument: the voluntary climate credit market.

The purpose was to increase forests' carbon sequestration capacity and their adaptation capacity, avoid major fires and contribute to the water supply, while maintaining biodiversity, and to involve private companies and local organisations in the achievement of these aims, which benefit society as a whole.

The specific objectives of the project were:

- To maintain and improve the mitigating and adaptive capacity of forests in Mediterranean Europe.
- To design a local climate credit market as a tool to incentivise multifunctional forest management.
- To raise awareness among all the actors interested in reducing emissions and helping woodlands to adapt to climate change, train them and provide them with appropriate tools.



PRINCIPLES

Multifunctional forest management, beyond carbon

“ We defend the role of forest management in achieving landscapes that are more resilient to climate change. ”

One of the goals we have set ourselves at LIFE CLIMARK is to contribute to the **mitigation of climate change**, reversing the recent slowdown in European forests' ability to sequester carbon. However, in the current emergency, it makes no sense to focus forest management on a single objective: any measures taken must necessarily include criteria for **adapting to new climate scenarios**, while ensuring financial viability. This is known as *Climate Smart Forestry*.

Putting multifunctional management into practice to meet climate challenges involves fulfilling the following objectives:

- Taking advantage of mitigation-adaptation synergies.
- Producing long-lasting goods from local resources whenever possible.
- Incorporating criteria for conservation and greater biodiversity.
- Identifying the management options that are most suitable for the characteristics of the local area.

Forestry measures that generate benefits in terms of mitigating and adapting to climate change

In Catalonia, and throughout the Mediterranean in general, there are three key processes related to climate change on which forestry management can have a positive impact: the carbon balance (mitigation), the water balance (adaptation) and the conservation of biodiversity (mitigation/adaptation).

The LIFE CLIMARK project has identified forestry measures that can have a positive impact on these three processes. They are mainly aimed at promoting the **management and restoration of existing forests**, within which **the planting of new trees** is an option, while ensuring their ecological, technical and economic viability.

Carbon

Fixation and conservation of carbon stocks in forests, soil and products.

Sustainable forest management could increase the climate change mitigation capacity of forests by up to 20%. With good planning, forest management can help to:

- **Conserve carbon currently stored in forests**, for example with measures to prevent fire, encouraging the production of long-life wood products and taking care not to damage woodland soil.
- **Maintain the forest's capacity for carbon fixation**, increasing its vitality and growth in regulating competition for resources and, locally, by planting new trees where this is logical in ecological, technical and economic terms.

The production of locally sourced renewable raw materials like timber or cork contributes to the **replacement of fossil fuels and materials**, thus contributing to the targets for decarbonising the economy envisaged in policies on climate change and promoting the bioeconomy.



Water

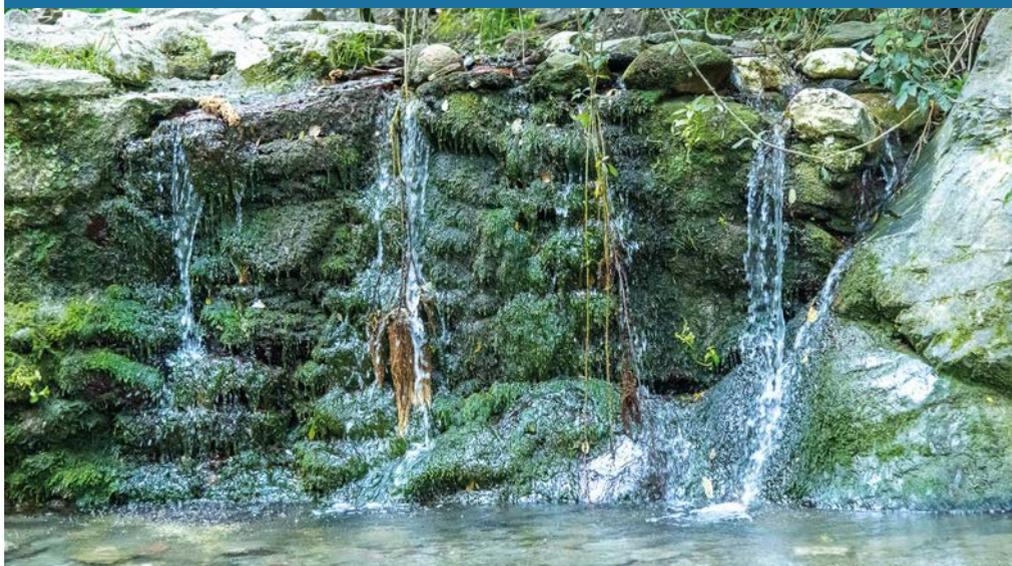
Reducing water consumption in woodlands

One of the main consequences of climate change in Catalonia is a reduction in water resources. Having woodlands that can consume less water is thus a key factor in being able to adapt to recurring periods of drought.

Measures are being taken with a view to **regulating the number of trees** in woodland located in river basins where surface water is exploited or over aquifers, which are a strategic element in maintaining stable supplies of water in the region. If the number of trees is reduced, they intercept and consume less water, so that more is filtered and released into the river basin.

We need to achieve a balance that enables us:

- To **increase the amount of water filtering back into aquifers and rivers**, wherever possible.
- To ensure **water is consumed more efficiently** by woodlands.
- To maintain healthy tree cover to **control flooding and guarantee the quality** of the water generated.



Biodiversity

Biodiversity conservation and improvement

At LIFE CLIMARK, in addition to supporting the conservation of biodiversity, we want to make a decisive contribution to enriching the biodiversity of the forest areas managed.

We foster **integrated management** that protects and increases woodland biodiversity in managed forests. This can be done, for example, by keeping large diameter trees when felling or generating dead wood, thus providing a habitat for a wide range of organisms. Biodiversity can also be enhanced by planting new native species suitable for local conditions.

According to the stage of development of each of woodland, based on a prior diagnosis using the **Index of Biodiversity Potential (IBP)**, we can determine the most effective measures for each forest stand.



Resilient landscapes: Coherent management on a landscape scale, based on local participation and increased governance

Forestry measures are more efficient and have a greater impact if they are not implemented in isolation but are based on analysis and the establishment of priorities on a landscape scale with the cooperation of all stakeholders.

We have therefore introduced the idea of *Forestry projects for mitigation and adaptation to climate change (PROMACC)* based on joint forestry management:

- These are **executive projects promoted voluntarily by a group of forest landowners in a particular area**, who commit to carry out forestry management measures that contribute to the area's ability to mitigate and adapt to climate change, over a maximum of three years.
- They are based on **participatory planning on a landscape scale**, setting forest management priorities according to mitigation and adaptation criteria in line with local development targets.

The forestry authorities supervise the drafting and implementation of PROMACC projects to ensure they comply with LIFE CLIMARK objectives and that climate credits are effectively generated by the planned measures.



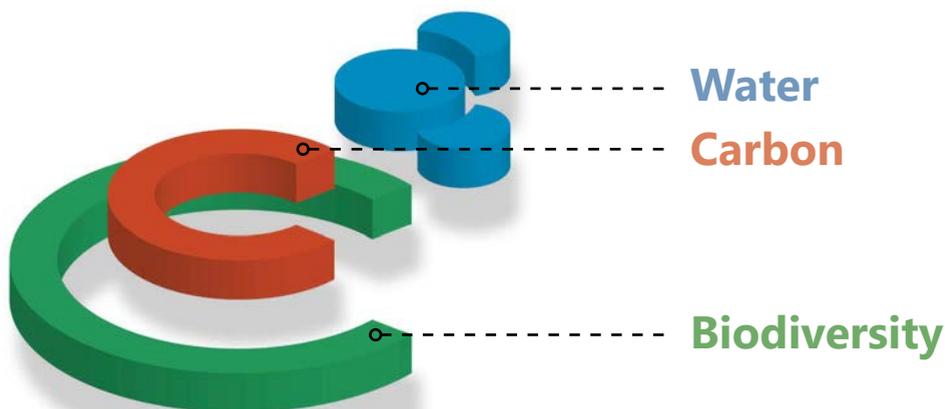
The climate credit market: a vehicle for the joint responsibility of companies and institutions in multifunctional forest management

LIFE CLIMARK has created a new instrument to fund the ecosystem services provided by multifunctional forest management in connection with the challenges posed by climate change: the **voluntary climate credit market**.

This market must bring forestry projects into environmental funding circuits, enabling businesses and institutions to invest in nature-based solutions in Catalonia as part of **voluntary compensation or corporate social responsibility initiatives**. The aim is to establish contact between promoters (forest owners) and purchasers (companies committed to the environment or that want to offset their emissions) to generate an economically viable activity so multifunctional and climate-smart forest management can be implemented.

The market is based on a new unit of exchange: the **climate credit**, designed to highlight the fact forest management requires a global perspective, **beyond carbon**. Climate credits are calculated, therefore, based on the positive impact of forestry management on three key vectors related to mitigating climate change and adapting to it: **carbon, water and biodiversity**. **One climate credit is equivalent to the creation of one hectare of resilient forests**.

The *Forestry projects for mitigation and adaptation to climate change (PROMACC)* are the vehicle for climate credit transactions in the market.



WORK CARRIED OUT WITHIN THE LIFE CLIMARK PROJECT

The concept and design of the new climate credits market and the tools needed to implement it were produced through a collaborative effort over six years (2018-2022) carried out by various entities coordinated by The Forest Ownership Centre under the umbrella of the LIFE CLIMARK project, jointly funded by the European Union.



We have tested the concept of **multifunctional forest management** for climate change mitigation and adaptation, **applying it in the field** more than 100 hectares, on 28 forest estates distributed throughout Catalonia

We have worked on **six landscape units** (LUs), that represent the spectrum of Catalonia's landscape and territorial diversity. A **diagnosis of the ecosystem** was undertaken in each one of these units in order to determine the needs, limitations and strengths of each territory.

Forest stands were identified **where the application of forestry measures could have an impact, in terms of mitigation or adaptation, on carbon, water and biodiversity** and cooperation agreements were signed with the owners, so that the measures could be implemented and subjected to long-term monitoring.

This work allowed us to draw up an **extensive list of "climate smart" forestry management practices**, beyond planting, based on the sustainable management of existing forests, also including measures to prevent fires. All the measures involved increase the (financial and ecological) value of the forest and are **intended to protect or restore ecosystems**.

2

5

3

2

5

4

6

1

7

3

6

1. Montmell LU
2. Vall de Rialb LU
3. Aspres LU
4. Replans de Berguedà LU
5. Capçaleres del Llobregat LU
6. Serres d'Ancosa LU
7. Region of Véneto

Selective thinning in a mature black pine forest in La Vall de Rialb. Main vector: Carbon (sequestration, products, fire) - Water-Biodiversity.

Recovery of the agroforestry mosaic in Les Capçaleres del Llobregat. Main vector: Water (supply) - Biodiversity

3

6

Selection of shoots and selective clearing after a wildfire in Els Aspres. Main vector: Carbon (sequestration, fire) - Biodiversity.

Enrichment planting in Les Serres d'Ancosa. Main vector: Carbon (sequestration) - Biodiversity

Example of some forestry measures applied for demonstration purposes in around 100 hectares on 28 private estates in six Catalan landscape units.

2

We have carried out an assessment of the **short-term impact of forest management (*ex post*)** on environmental indicators and we have installed on-site monitoring systems for the **most innovative indicators**, such as **the impact on water or on soil carbon**

The best **indicators of carbon, water and/or biodiversity have been analysed and identified at stand level**, together with methods for verifying them in order to **define a baseline** for characterising and assessing **the impact of forest management**.

Twenty-eight private estates were monitored before and after forestry management measures were taken. This was complemented by the monitoring of 25 stands more in Catalonia belonging to the CPF network of demonstrative plots, and 2 in Italy, where similar measures had been applied previously, so that an *ex-post* assessment could be carried out 5 years after the forestry measures were implemented.

An **innovative monitoring system was designed and installed at two locations to verify the water balance estimates provided by theoretical models over the medium term**. In this task, which is still ongoing, the collaboration of two key entities has been essential: the Catalan Water Agency (ACA) and the Institute of Environmental Assessment and Water Research (IDAEA-CSIC), who have carried out monitoring in forests at La Llacuna and Conca de Vallcebre, respectively. The Forestry Science and Technology Centre of Catalonia (CTFC) has also initiated **a line of work to gauge the impact of certain forest management practices on the carbon accumulated in forest soils** in the medium and long term.



Monitoring of water balances in La Llacuna site, by technicians of the Catalan Water Agency of Catalonia.

3

We have developed **methodologies to estimate the impact of medium- and long-term forestry management (*ex ante*)** which are as robust possible, according to our current knowledge

Quantifying the impact of forestry management on carbon, water and biodiversity has not been easy. It is a task that involves years of research and monitoring and the collaboration of several experts in each of these areas.

At LIFE CLIMARK, **we have built on work done in previous projects**, extended through networking with other projects currently in progress and organisations inside and outside Catalonia. Our selection of methodologies was guided by the extent to which they are **internationally recognised**, as far as possible, and/or the highest level of consensus, in accordance with the knowledge and precision currently available. We also created **expert committees** to help to ensure that the project is sound and can be replicated.

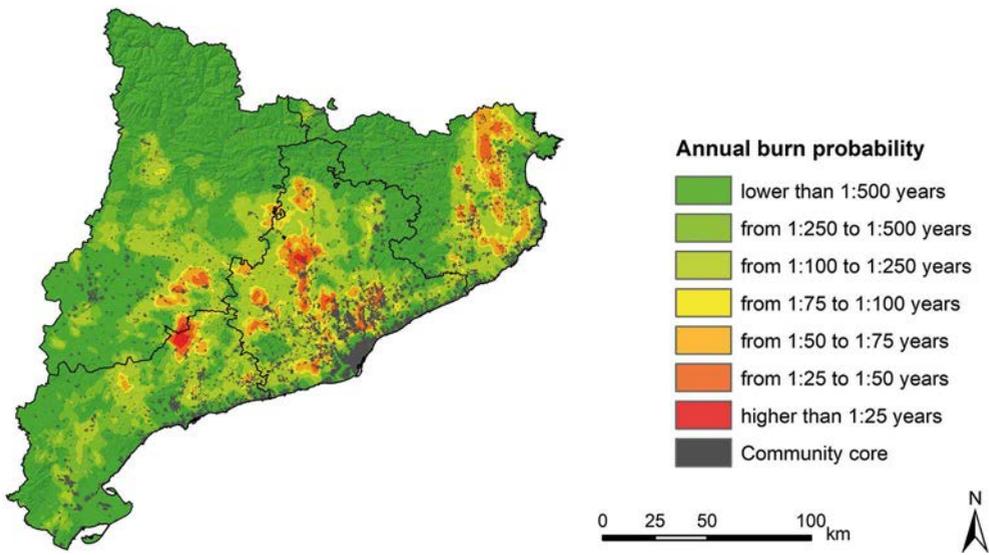


Water experts meeting at the Vallcebre site, in the watersheds being monitored by CSIC-IDAEA.

This produced a ***Methodology for estimating the impact of forestry management on the carbon balance, water and biodiversity***. In the first version (2022), the impact of management on the carbon balance has been obtained for the main conifers in Catalonia (the Aleppo pine, Scots pine and black pine) and for holm oak. The impact of management on hydrological resources (blue water) and biodiversity is applicable to all woodland types.

The methodology developed includes the following innovations:

- **Assessing the effect of fires and preventive management on the carbon balance.** The **University of Lleida**, which is partner in the project, has tackled the challenge of calculating, for the first time in Europe, the **likely CO₂ emissions from major forest fires** and the reduction brought by applying forestry management measures designed to prevent fires.



Map of the Annual burn probability. Source: Alcasena, *et al.* (2019).

- Development of a methodology to **quantitatively estimate the amount of blue water generated in a river basin as a result of reducing the number of trees** in the forest. To achieve this, we have benefited from the expertise of various institutions and research centres within the project and external to it (CTFC, CREAM, CSIC-IDAEA, ACA).
- With regard to biodiversity, we decided to use the **Index of Biodiversity Potential (IBP)**, a tool that is simple to use in the field and summarises the results of years of research into the link between the composition and structure of forests and the biodiversity it hosts. As well as allowing us to estimate a particular forest's ability to host biodiversity, the IBP enables us to define comprehensive integrative forestry management measures, which projects must apply, if climate credits are to be claimed.

4

We worked with **companies willing to invest in forestry management projects** for mitigation and adaptation, in the design of the climate credit market so that it could respond to their environmental and social needs

Based on our work with experts and partner companies, and with the help of the Close to Market team (C2M) of the LIFE program, we have worked on the marketing strategy and the market prototype design, so that the forestry projects generating climate credits could offer companies the following:

Security and visibility

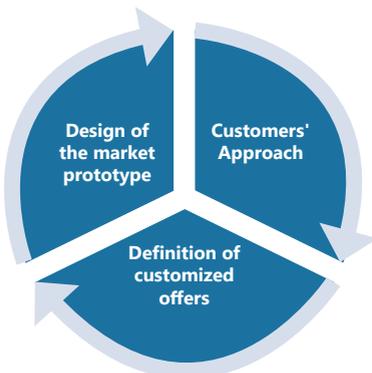
A trustworthy investment option, offering transparency and visibility, through the Climate Credit brand, as part of their CSR policies or to comply with the companies' ESG objectives. Linking a corporate brand to values related to climate change mitigation and adaptation.

Customisation

Manage the impact of business activity comprehensively, considering not only CO₂ emissions but also water consumption and/or its impact on biodiversity. According to the needs of the purchasing entity, access to complementary services that make the contribution of the credits to the company's values more visible to employees and customers and/or in the area to which it has contributed.

Impact on the local environment

To provide a channel for companies and institutions to make a joint commitment to sustainable development and the natural environment in the area where they operate, generate quality employment, and help to keep the rural area and its landscape alive.



5

We have designed **the climate credit market** as a system for funding the ecosystem services provided by forestry management

Based on a prospective study and consultation with experts, a market has been designed to provide responses to the problems most commonly encountered in connection with this type of mechanism: **Additionality, temporality and permanence, action monitoring and verification, and the integration of quantitative and qualitative variables.**

We also defined the legal framework for the future market, identified the different actors involved and their roles, and studied the tax issues that could affect the credits.

Main functions of the stakeholders in the Climate Credit Market

A. Public authorities (forestry and climate change administration)

- Define the methodology for implementing a PROMACC.
- Validate the minimum quality of a PROMACC and the impact of forest management on carbon, water and biodiversity balances and other forest ecosystem services.
- Verify that the measures have been carried out.
- Quantify and validate the climate credits provided for each PROMACC.
- Issue the certificate to the buyer.

B. Forest landowners

- Make available to the PROMACC the land on which forestry works are to be implemented and authorise the forestry models and itineraries to be applied.
- Facilitate the relevant forestry administrative procedures.

C. PROMACC promoters (association of forest landowners)

- Promoting and coordinating the PROMACC with the individual landowners.
- Coordinate the partnership agreement with the owners.
- Seek financing through climate credit buyers.
- Manage contracting and payments for the tasks associated with the implementation of the PROMACC.
- Participate in the dissemination activities.

D. PROMACC funders

- Buyers of the climate credits that finance the project.
-

6

We conducted various **pilot tests** to check the process of generating and funding climate credits

In Catalonia, **eight pilot trials** were carried out in areas with contrasted environmental and socio-economic characteristics. The pilot studies evaluated all stages in the process, from planning and calculating the credit and drafting the PROMACC to securing private and public funding and the final transaction. Various communication and team-building activities were also conducted.



- **Lord Valley:** Valley of the Cardener basin in El Solsonès above the Llossa del Cavall water reservoir that covers three municipalities: Sant Llorenç de Morunys, Guixers and La Coma i la Pedra. Forests are dominated by scots pine and oak which have naturally expanded due to the rural abandonment. The promoter is the Lord Valley Forestry Association, and the project includes strategic fire prevention areas and areas that supply the main watercourses running through the valley.
- **Segre-Rialb Basin:** covers 6 municipalities in the counties of La Noguera (Ponts, La Baronia de Rialb and Tiurana) and L'Alt Urgell (Peramola, Bassella and Oliana) in the rural area surrounding the Rialb water reservoir. The promoters were the Segre-Rialb Basin Forestry Association. The project mainly promotes ecological restoration in an area affected by recurrent wildfires.
- **Strategic fire prevention area of Les Arenes:** peri-urban forests in the municipality of Castellar del Vallès (Vallès Occidental), located in a strategic area for the

prevention of large forest fires. The main financing entity was Castellar del Vallès Town Council and the entity promoting forest management was the Forest Owners Association of Castellar del Vallès, Gallifa and Sant Llorenç Savall.

- **Serra de Collserola:** A Natural Park close to the city of Barcelona, taking in nine municipalities in the Baix Llobregat and Vallès Occidental counties. The priority is the conservation of biodiversity and the prevention of fires because of its proximity to scattered housing areas and major road infrastructures. This pilot was financed 100% by private funding.
- **Serres de Miralles-Ancosa:** located in the Anoia county, dominated by extensive masses of Aleppo pine with a high risk of forest fire and low profitability. The main promoters were the Miralles-Orpinell Forest Owners Association. The project foresees restoration measures in the area affected by the last forest fire in 2021, together with forest fire prevention initiatives and the provision of water for the Carne-Capellades aquifer.
- **La Garrotxa Volcanic Zone:** The limits of the area analysed coincide with the limits of La Garrotxa Volcanic Zone Natural Park (PNZVG) and the promoter of this first PROMACC is the the park management body. The following have been defined as priority areas: degraded areas or where there are exotic invasive species, areas whose productive potential needs to be recovered, and areas with potential to regulate the hydrological regime and water resources.
- **Bianya Valley:** The limits of the landscape analysed coincide with the limits of the Vall de Bianya municipality, although this first PROMACC focuses on the low-lying parts of the valley, which are of higher quality. The PROMACC's promoter is the regional forests owners' association Consorci Forestal de Catalunya and there is a single private funder, which is a local agrifood company.
- **Muga Valley:** Sub-basin of the River Muga, which goes from the headwaters of the river to the Darnius – Boadella water reservoir. It includes the municipalities of Albanyà, Cabanelles, Sant Llorenç de la Muga, Maçanet de Cabrenys, Darnius and Tarrades (Alt Empordà). The promoter is the foundation Pioneers of Our Time. Priority has been given to the recovery of water resources and the restoration of the productive potential of the forests.

In Italy, Work is in progress on replicating a possible climate credit market in the Veneto region, where the LIFE CLIMARK approach is being promoted for the management of the Friuli-Venice-Julia regional woods.



Pilot trial in the municipal forests of Friul-Venice-Julia, to promote biodiversity.



Serra de Collserola.



Strategic fire prevention area of Les Arenes.



Segre-Rialb Basin.



Serres de Miralles-Ancosa.



Lord Valley.



Muga Valley.



Bianya Valley.



La Garrotxa Volcanic Zone.

7

We have made every **effort to raise** awareness of the concept of climate credits and the benefits of multifunctional forestry management, informing potential participants in the market researchers and society as a whole

Communication with the **general public**

- **Leaflet presenting** the project and portable **roll-up**.



Leaflet presenting the project.

Roll up portàtil.

- **Website page:** www.lifeclimark.eu and **4 electronic bulletins.**
- Participation in **social media** (Facebook and Twitter).
- Installation of **4 outdoor information panels and 2 indoor panels.**
- **3 press releases:** 2 general notes about the project and one on pilot studies.
- **44 appearances in digital and paper media:** 1 on television, 4 on radio, 6 in regional press and 32 in local press.



Website homepage of LIFE CLIMARK project.

Informative panel installed at the demonstrative site in UP Capçaleres del Llobregat.

Information sessions for potential forestry promoters and investment companies, in Catalonia and Veneto

- **13 information sessions and fieldtrips for the forestry sector** to explain the role of forestry management in mitigation and adapting forests to climate change.
- **17 training workshops** to familiarise participants with the LIFE CLIMARK and **7 technical articles** in forestry sector journals in Catalonia and Italy.
- **27 meetings with potential purchasers** of climate credits.
- **2 information leaflets printed** (1 for promoters and 1 for purchasers) and **1 digital catalogue** explaining how to participate in the climate credit market, aimed at owners and companies/institutions that may buy credits.

Overall, the project has been presented to **358 forestry owners and managers, 260 private sector and government specialists, 126 students, and 30 public and private purchasing entities**, while training has been provided for **78 forestry workers**.



Fieldtrip of the technical seminar "Impact of forest management on the ecosystem services: carbon, water and biodiversity. Water balance monitoring setup in the twin-watershed experiment at La Llacuna.



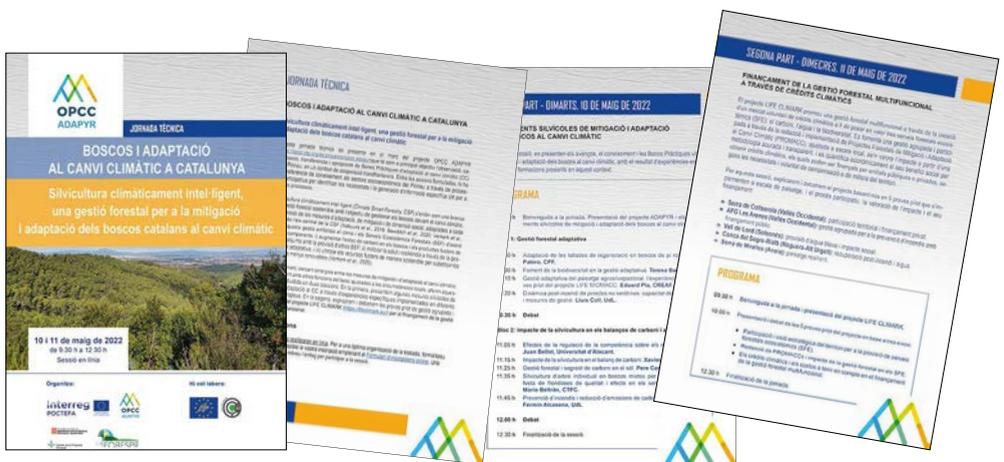
Informative leaflet for companies.



Informative leaflet for forest owners.

Networking awareness raising activities among researchers, government bodies and national and international organisations

- **16 networking activities** with organisations and projects working on forestry management and payment for ecosystem services (PES) schemes.
- **5 scientific articles in high-impact international journals.**
- **Participation in 34 events organised by national and international projects and institutions:** invited communications, oral presentations and posters at seminars, conferences, meetings and workshops.
- **End-of-project conference.**



Life CLIMARK final conference: Forests and climate change adaptation in Catalonia



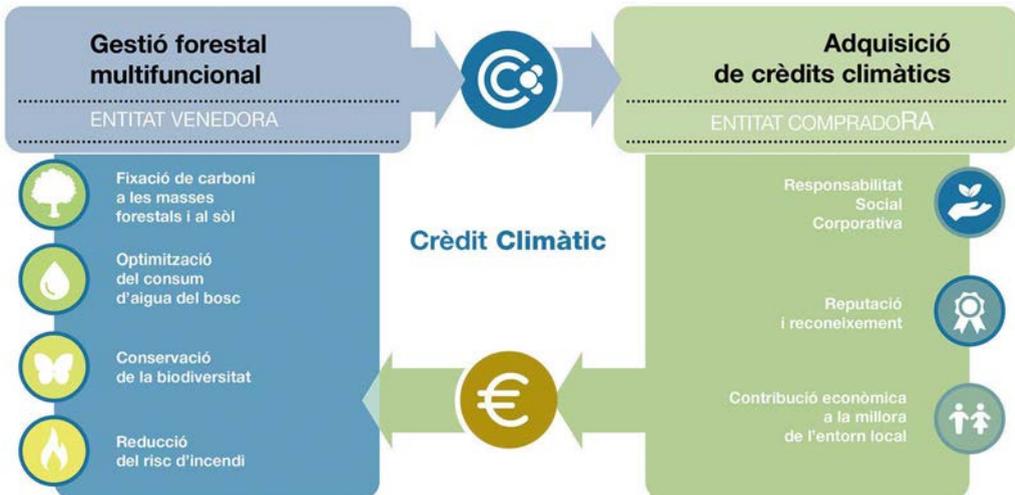
Seminar "The market of Climate Credits, a tool to promote multifunctional forest management" hosted by the Climate Action Catalan Ministry in the fall of 2022.

MAIN PRODUCTS AND RESULTS GENERATED

As a result of five years' work by the five partner organisations in the project, with the assistance of the forest owners and public and private institutions that have supported us, the LIFE CLIMARK project has achieved the following:

Main products

- 1) Design of a pioneering regional funding mechanism for ecosystem services generated by forest management: the new *Voluntary climate credit market*. In Catalonia, the market has government approval, and it is hoped that it will be formally implemented in 2023. In Italy, consideration is being given to incorporating CLIMARK methodology in the new national regulations for carbon accounting.



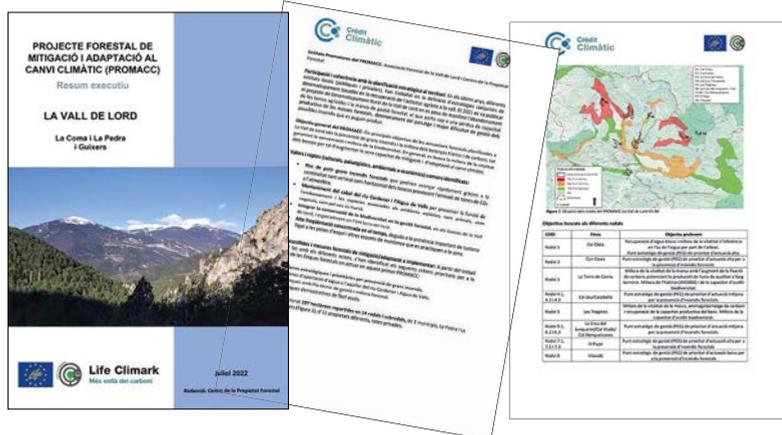
- 2) Publication of the **1st Methodology, for estimating the impact of forest management on the carbon and water balances and on biodiversity**, agreed with the main research experts and participants.



Methodology for estimating the impact of forest management on the carbon and water balances and on biodiversity.

- 3) Introduction of the idea of the **Forestry projects for mitigation and adaptation to climate change (PROMACC)** based on joint forestry management. So that local associations and forest ownership groups can draw them up, the following have been prepared:

- **Instructions for drafting and implementing PROMACCs.**
- a **Calculator** for easily assessing the impact of a particular forestry measure on carbon, blue water and biodiversity, and the climate credits it will generate.

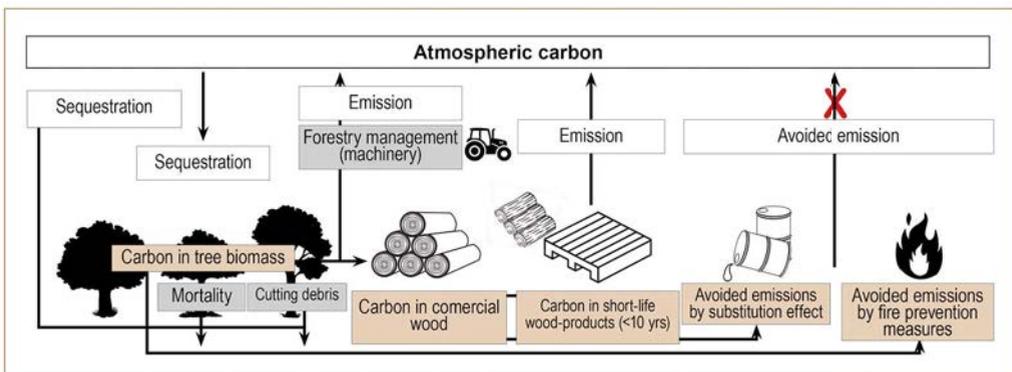


Forestry project for mitigation and adaptation to climate change (PROMACC) produced by the forest owners' association for the Vall de Lord pilot trial.

Relevant information on the impacts of forest management on the carbon and water balances and on biodiversity

The project has generated **relevant information on the medium-term (15 years) environmental and socio-economic impact of the forestry measures implemented**, with a view to determining the potential of forestry management in achieving the decarbonisation and adaptation targets set for 2050. The main results of this research, which have been published in twelve scientific and technical papers, can be summarised as follows:

- Carbon:** considering all the capsules envisaged in the CLIMARK methodology (figure), **the forestry management measure with the greatest positive impact on the CO₂ balance in the medium term (15 years) was thinning to reduce competition in adult forests**, while thinning in dense young regenerated woodland had an averaged reduced or negative impact on the total carbon balance, in comparison with an unmanaged forest. The nature and magnitude of the impact are influenced by the species involved, the quality of the habitat, the intensity of thinning and the use made of the products generated. **The impact of new tree planting in the same period has been lower** than that of thinning.



- Blue water:** a direct positive relationship has been found between reductions in basal area and the amount of water exported, more intense thinning leading to the generation of more blue water. **The impact is greatest when the forest is younger**, the opposite to that observed for the carbon balance. The recovery of former pastureland, with the permanent elimination of trees, leads to a greater gain which is maintained over time. The monitoring carried out in the twin basin experiment (one managed and one unmanaged) at La Llacuna **shows that forestry management is capable of generating blue water, even at basin scale, and confirms gains of the order of 12%**, estimated with the theoretical model for this low rainfall area.

- **Biodiversity:** the forestry management proposed in the CLIMARK project is an **integrative management**, i.e. it aims to maintain the key elements that provide greater biodiversity in each particular forest, or even generate new elements if the characteristics of the forest make this advisable. Consequently, **all managed stands under the integrative paradigm at least maintain their capacity to host biodiversity, or even improve it**, compared with the situation if that forest was not managed at all. The improvement with respect to the initial situation is measured as a % increase in the Index of Biodiversity Potential (IBP) and varies according to the forest's stage of development and the measures applied.



- **Socio-economic aspects:** the **cost of preparing a PROMACC** has been analysed. Drafting and implementing the project, attracting participants and seeking funding cost an average of **3,500 euros/ha**. A market instrument has been designed, offering **small forestry companies a new business model**. Aspects that can be included in the future climate credit market related to improving **forestry workers' conditions** have also been studied. A forestry project model (the PROMACC) has been developed with a view to **coordinating the on-field implementation of EU policies on climate change**, forestry management and ecological restoration.



Impact on the region

Besides the work carried out through the project actions, the application of the mechanism for climate credit market, via **8 pilot trials**, has achieved the following:

- **Over 450 hectares made resilient to the effects of climate change**, the total impact expected from the PROMACCs implemented in the first 5 pilot schemes, over the next 15 years, being: **14,500 tCO₂, sequestered or avoided, 757.000 m³ of water generated and a 26% improved ability to host biodiversity of the managed forests**. These hectares are in addition to the 100 managed as demonstration schemes directly funded by the project.
- **Over 225,000 euros raised from private and local entities to support multifunctional forestry management**. When the 8 pilot trials will be completed, this amount would rise to **1,400,000 euros**.
- **8 local and regional associations of forest owners trained and working towards joint forest management** that will foster climate change mitigation and adaptation, and offered an alternative business model.
- **Over 30 public and private organisations committed** to supporting multifunctional forestry management in Catalonia for climate change mitigation and adaptation. 5 of these have already funded activities envisaged in the PROMACC.
- **Presence in over 30 local and regional media**.
- **Synergies generated with partner organisation contributing to the pilot trials**, mainly regarding communication (i.e. promotional video for climate credits) and awareness raising at local level (i.e. a pedagogical itinerary and activities with primary school pupils).



Awareness raising activity in the pilot trial in Serra de Collserola, in coordination with the local administration.

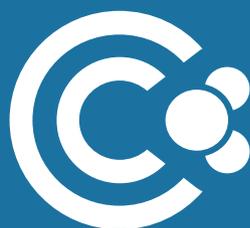
THE CHALLENGES AHEAD

For climate credits to become a new way of working and recognising the importance of forests and their management in the new climate context, there are still issues to be resolved and we are committed to tackling them through the after-LIFE planned activities:

- Regulation of the climate credit market, the formulation of PROMACCs and the mechanisms to pay for the provision of the different ecosystem services.
- Ensuring that the market is transparent and credible.
- Replicating the scheme so that there are a greater number of resilient landscapes, within and outside Catalonia.
- Promoting new ecosystem services, provided by forestry management in the Mediterranean.
- Developing *ex-post* methodologies to determine the impact of measures taken, using new technologies.
- Increasing training and improving companies engaged in forestry work.
- Improving communication and raising awareness of the role of multifunctional forest management in the eco-social transition towards a more resilient planet.



Partner institutions in LIFE CLIMARK.



**Climate
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The LIFE CLIMARK project (LIFE16 CCM/ES/00005)
is a LIFE climate change mitigation project,
cofinanced by the European Union Program



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