

Group Certification for Sustainable Forest Management: Promoting Shared Forest Management and Ecosystem Services Enhancement

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introduction

Active and sustainable forest management is considered crucial for the enhancement and development of mountain areas, rural regions, and the communities living in these territories. Sustainable forest management actions can positively influence the protection and enhancement of forest ecosystem services, which are defined as the benefits ecosystems provide to humanity. These services play a key role in the production of forest products and bioeconomy (both wood and non-wood products), while also preserving valuable landscape and environmental values, as highlighted by the new Italian Forest Strategy and the new Italian Forest Law (Guida 2020; Ministero delle politiche Agricole et al. 2021). Excellent examples of high value forests landscape can be found across every region of Italy, each with its own unique characteristics and history (Agnolletti et al. 2022). However, over the last 50 years, the high fragmentation of forest ownership has posed a limit to the implementation of sustainable forest management actions, leading to forest land abandonment (Cadez et al. 2023; Giannetti et al. 2023). As a result, the forest value chain suffers and remains poorly organized (Cadez et al. 2023; Giannetti et al. 2023).

Implementation

In this regard, cooperation and forest certification are considered both valuable and essential tools for promoting the sustainable management of forests, allowing for the

management of larger areas and ensuring that forest products reaching the market originate from sustainably managed forests. In Italy, two reference standards for sustainable forest management certification exist under PEFC: PEFC ITA 1000 and ITA 1001-1. These standards, which can be accessed for free on the PEFC Italy website (<https://pefc.it/per-i-proprietari-forestali/come-ottenere-la-certificazione-forestale-pefc>), outline the criteria and indicators that must be met to obtain and maintain PEFC certification.

The project 'CO2 S.Fo.Ma. MARCHE,' an Operational Group funded by Measure 16.1 of the Regional Rural Development Program of Marche, has identified cooperation as the main driver for implementing Sustainable Forest Management, PEFC certification, and enhancing ecosystem services, while also addressing the issue of land fragmentation.

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The GO was carried out between 2019 and 2021 in the forests of the Marche region (central Italy), with a partnership consisting of public and private forest owners and managers, aimed at obtaining certification for sustainable forest management. In details, the partnership for carrying out the OG was formed under a

multi-actor framework and consists of three Agricultural-Forest Management Companies of the Agro-Silvo-Pastoral Asset (SAF): SAF Marche (project coordinator), SAF Monti Azzurri, and SAF Tronto; the Consorzio Marche Verdi S.c.a.f., which brings together the forestry workers responsible for carrying out forest interventions (e.g., harvesting activities, road construction); two technical forest consulting companies, D.R.E.Am and Pro.Mo.Ter; the PEFC Italy association, which manages PEFC certification standards in Italy; and the scientific partner, the Consorzio Universitario per la Ricerca Socioeconomica e per l'Ambiente (CURSA), which supports the implementation of research funding within the GO activities. The CIA Ancona also participates by contributing to knowledge transfer to other economic operators in the Marche region. Additionally, from the start of the GO, two additional forest owner consortiums voluntarily joined the activities: the Consorzio Speciale Aziendale del Catria and the Consorzio Marche Verdi, both of which were interested in forest certification.

It is important to note that the actors involved in CO2 S.Fo.Ma. MARCHE have been managing the forest areas across the entire Apennine range of the Marche region for decades, from the lower altitudes up to the high-altitude Apennine pastures. The project focused on a highly diverse forest territory, encompassing most of the forest types cataloged in the Marche region (IPLA 2000). The GO partners manage approximately 9,200 hectares of forest, for which Detailed Forest Management Plans are already in place.

Since these forest management plans were already in place for all the forest areas, the main activities of the GO to achieve forest certification and quantify Sustainability Credits involved adjusting the plans to meet the indicators of the PEFC GFS certification scheme (ITA 1000 and PEFC ITA 1001-1). These activities were carried out by D.R.E.Am. Italia. Specifically, each management plan was reviewed, harmonized, and, where necessary, integrated with the required elements to ensure

full compliance with the certification scheme. The harmonization process was important because the GO aimed to obtain the PEFC group certification rather than individual certification for each property.

In fact, PEFC group certification allows small forest property owners or managers to come together, pool their resources, and work collectively to obtain certification. This makes the process more accessible and feasible for small forest owners. To streamline the organizational aspects of Sustainable Forest Management certification and reduce associated costs, the group certification model serves as an alternative to individual certification. It allows multiple public and private forest owners or managers to be certified as a group, with a leader designated to represent the group and ensure that the forest management practices of individual owners within the certified area comply with PEFC requirements.

The unitary costs of consulting and group certification are reduced compared to individual certification, as these costs are shared among the members. Similarly, operational costs are also lowered, since certain activities—such as management planning and monitoring—can be carried out at the group level.

Following this approach, within the CO2 S.Fo.Ma. MARCHE project, the 'Bosco di Marca' Sustainable Forest Management group was formally established. The group is composed of project partners SAF Marche, SAF Tronto, and SAF Monti Azzurri, with the addition of one additional consortium, Azienda Speciale Consorziata del Catria.

Through the GO activities, the former group established its structure via a private agreement, with SAF Marche as the lead and three other members, defining commitments and activities for each party.

In addition to a manager overseeing the entire system and individual group members, specific roles were defined for internal audits, communication, and training.

This structure allowed for the designation of individuals responsible for specific activities within different members, optimizing both time and costs, while also 'specializing' each member in a particular function to enhance quality.

However, the intent of the GO was not only the one-off obtaining the sustainable forest certification but also to work for the enhancing ecosystem services, primarily linked to improving the carbon cycle in forests in terms of absorption (sink) and storage (stock).

To achieve this objective, a specific action was designed, coordinated by CURSA, to establish the general methodological criteria for determining the additional amount (additionality) of carbon generated by the sustainable forest management activities.

In details, "Additionality" in the context of carbon stock refers to the concept that carbon sequestration efforts or projects should result in carbon storage that would not have occurred without the specific action or intervention. In other words, additionality means that carbon storage is "additional" to what would have happened under a baseline scenario or "business-as-usual" situation.

For example, if a forest management project is implemented to enhance carbon sequestration, the carbon stored by that project must be extra or additional to what would have been stored if the forest had been left to grow without any management intervention (e.g., no thinning, no change in forest practices).

This is an important principle in carbon markets, carbon offset programs, and environmental policies, as it ensures that actions taken to mitigate climate change are genuinely contributing to additional carbon sequestration or emissions reductions, and are not just activities that would have occurred regardless of the intervention.

In this context, the GO worked on developing a methodology tailored to the specific characteristics of the forests involved in the project, assessing the CO₂ absorption potential of the agroforestry systems. The results of previous silvicultural interventions were analyzed, along with the establishment of experimental plots in selected areas. This approach allowed for the analysis of both historical and new data, which were used to study the carbon storage performance of the main forest types and the various types of forest interventions (e.g., harvesting methods such as thinning and final rotation period cuts, as well as management types like coppices and high forests).

In detail, the experimental protocol compared coppice forest plots in mixed hardwood and beech coppices that were not subjected to silvicultural management (control) with coppice forest plots that were managed through silvicultural interventions.

Firstly, the plots (both control and managed) were selected to have similar characteristics in terms of age, site conditions, and management history. Additionally, within the managed plots, it was possible to identify different forest areas where similar treatments had been applied a few years earlier. This allowed for the reconstruction of carbon absorption data, in conjunction with the data from the experimental plots, to calculate the carbon absorption related to forest management in coppices through the analysis of the increments.

The cooperation established by the GO and the former certification group was also crucial for these actions, as it enabled the pooling of efforts and data, facilitating the calculation of pricing data for carbon stock. This shared action allows the group to obtain precise local data to calculate the additionality and to obtain the certification of Sustainable Ecosystem Credits under the PEFC standards.

Moreover, the GO CO2 SFoMa Marche also worked to create a market for Sustainable Ecosystem Credits. Specifically, an online information exchange platform for Sustainability Credits was developed, where potential stakeholders interested in learning about the GO and offsetting their climate-changing emissions can purchase Sustainability Credits or fund projects aimed at enhancing ecosystem services. Additionally, the platform will connect other entities offering credits with economic operators interested in carbon offsetting or funding projects.

The platform, already operational, aims to connect supply and demand. When a buyer is interested in supporting a particular additional project, the area and type of activity to be carried out are identified, and the resulting positive impacts are quantified. The verification of these additional actions is carried out by the Control Body, which will annually check compliance with PEFC standards.

This platform can be accessed via the project website (www.co2marche.it), and offers participation not only to project partners but to any manager wishing to follow the outlined path.

Conclusions

The activities of the CO2 SFoMa Marche project have shown promising development prospects for the enhancement of sustainable forest management, highlighting the importance of aggregation among forest owners and managers, with PEFC certification as a unifying element of communication and enhancement, even for the generation of ecosystem services in managed forests.

The group certification model proposed in the project led to the largest group certification in central Italy, covering 9,208.25 hectares to date. The three managing entities (SAF Marche, SAF Tronto, and SAF Monti Azzurri) were able, thanks to the implemented model, to involve the Azienda Speciale Consorziale del Catria in the group, potentially promoting SFM certification in

other areas of the region. This certification demonstrates the possibility of uniting forces, both public and private, overcoming territorial fragmentation and individualism for a common goal.

In these areas, through the achievement and maintenance of SFM certification, not only will continuous monitoring be guaranteed, but also the implementation of a continuous improvement program.

From the perspective of ecosystem services generated, it is highlighted that if these values were confirmed for all certified areas of the Bosco di Marca group, active management interventions could lead to the absorption of several thousand tons of CO₂, while simultaneously creating new business opportunities for forest managers. In fact, considering additional management actions, such as converting coppice to high-stem forests or extending coppice rotation periods in beech forests and mixed hardwood areas, up to 24,000 tons of CO₂ could be stored each year, equivalent to about 24,000 Sustainability Credits.

This does not include the presence and increase of other co-benefits that are not directly measured yet, such as increased biodiversity, improved water resource management, reduced erosion, positive images related to nature-based tourism, and more. Additionally, active and sustainable forest management guarantees the strengthening of social and economic aspects, such as the creation and maintenance of jobs in mountain areas, as well as raising awareness about the key role forests play in everyone's life.

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