



SOCIO-ECONOMIC IMPACT OF THE PROJECT MEASURES

D5

FOREST OWNERSHIP CENTRE



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CLIMARK

Forest management promotion for climate change mitigation through the design of a local market of climatic credits

DELIVERABLE

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SOCIO-ECONOMIC IMPACT OF THE PROJECT MEASURES

D5.1. Assessment of the socio-economic impact of the project

A series of forestry management measures were implemented during the project in the various landscape units studied, where there was a lack of incentive to manage them. Actions C1, C2 and C3, in particular, contributed to technical, economic and social benefits in the areas concerned and to maximising the existing potential of the treated forests in part or in full from a multifunctional perspective in terms of carbon, water and biodiversity in the framework of sustainable forest management.

Work was also done to publicise and raise awareness of the project within the community and among entities and others with an interest in the project, informing them about aspects including its general aims and the results obtained or expected, based on the data collected, calculations of the impact of the measures and the design of the climate credit market.

A range of indicators were used to assess the benefits achieved from these measures, taking into account both the socio-economic aspect (forestry work companies, the costs of executing forestry works, economic benefits, number of owners) and the educational aspect of the project (informative products and documents, sessions and workshops, participation in international events and networking activities).

D5.2. Study of the potential socio-economic impact in the scenario where the climate credit market is implemented

To make the project easier to replicate in other areas of Catalonia and to estimate the costs of implementing such projects, a number of measures were proposed, with associated costs, based on our experience of implementing this project. This has been done via various pilot projects, starting with an initial diagnosis and selection of stands, and including forestry management and the financing of the project. This process is carried out in accordance with the operational document for forestry projects for mitigating and adapting to climate change (PROMACCs), which details the region covered, the forests selected and the stands to be managed, assessing the impact of the work on three ecosystem services: carbon, water and biodiversity. To determine whether climate credits can eventually be obtained and their cost, we first need to analyse the cost of preparing and implementing PROMACCs, which will enable us to analyse the possibility of replicating the CLIMARK project.

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ACTION D5.1. ASSESSMENT OF THE SOCIO-ECONOMIC IMPACT OF THE PROJECT

1. Introduction

The implementation of the LIFE CLIMARK project and the execution of the planned forestry work has had an economic and social impact on the area. The execution of forestry work has associated costs and benefits. These include direct benefits from the sale of timber and social benefits in terms of job creation, training and boosting the local economy. The communication measures also have a direct benefit in terms of publicising the project and raising awareness. This report examines these concepts and the final impact of the project.

2. Indicators for assessing the socio-economic impact of the forestry measures

The socio-economic analysis of the forestry measures that form part of actions C1, C2 and C3 is performed at various levels: the forestry companies and workers that carried out the work, the cost of executing the works, the benefits obtained from the sale of the timber extracted and the number of owners participating in the project.

2.1. Forestry work companies

Actions C1, C2 and C3 were executed by local forestry companies with extensive experience of the forestry work required for the project. The project engaged 10 forestry companies employing a total of 42 workers, an average of 4 workers per measure. All were trained per the framework of the CLIMARK project, and carried out the work correctly as specified for the project. A total of 25 stands were subject to treatment, with a combined surface area of 88,45 ha. Table 1 details the local businesses that were involved in each of the landscape units that contain stands included in the project.

Table 1. Characteristics of the companies involved in the forestry work in actions C1, C2, C3.

Order no.	Participating companies	No. of employees involved per company	Location (LU)
1	Arnavat Obres i Serveis SL	5	Montmell
2	Berguedà Verd	4	Replans del Berguedà
3	Bosquerols SCCL	3	Serres d'Ancosa
4	Explotacions forestals Serra SL	4	Capçaleres del Llobregat
5	Forestal Empordà SL	5	Aspres
6	Forestal Catalana SA	3	Other LUs
7	Fusta del Solsonès SL	9	Vall de Rialb
8	Treballs Forestals del Berguedà SL	2	Replans del Berguedà
9	Narcis Tusell Puigbert	3	Other LUs
10	Serradora Boix SL	4	Capçaleres del Llobregat
	Total	42	

2.2. Cost of executing the forestry works

The cost of carrying out the forestry works, according to each implementation action (C1, C2, C3), totalled 178,322.06€ (2,267.27€/ha), considering taxes. Felling was carried out in x stands in regenerated post-fire forest at a total cost of 58,615.06€ (2,071.20€/ha). Felling was carried out in x stands in mature biomasses at a total cost of 70,937.66€ (1,803.19€/ha). Planting was carried out in x stands at a total cost of 48,769.34€ (2,343.55€/ha). The cost of each measure in each stand is shown in Table 2.

Table 2. Cost of executing measures in each stand (cost considering taxes).

Location (LU)	Stand	Cost (€/ha)	Area (ha)
Aspres	C1.1.1	2,480.50 €	6.50
Aspres	C1.1.2	2,480.50 €	5.00
Aspres	C2.1.1	1,851.30 €	5.10
Aspres	C2.1.2	1,815.00 €	4.30
Aspres	C3.1.1	3,963.71 €	1.00
Capçaleres del Llobregat	C2.5.1 & C2.5.2	1,463.16 €	3.64
Capçaleres del Llobregat	C2.5.3*	-	5.00
Montmell	C1.2.1	2,907.08 €	4.40
Montmell	C2.2.1	2,131.88 €	4.00
Montmell	C3.2.1	3,265.48 €	1.70
Replans del Berguedà	C1.4.1 & C1.4.2	2,740.83 €	3.20
Replans del Berguedà	C1.4.3*	-	5.40
Replans del Berguedà	C1.4.4 & C1.4.5	2,244.08 €	3.80
Serres d'Ancosa	C2.3.1	1,429.23 €	4.40
Serres d'Ancosa	C2.3.2	3,570.95 €	3.80
Serres d'Ancosa	C3.3.1	2,195.43 €	1.50
Serres d'Ancosa	C3.3.2	2,229.31 €	4.00
Vall de Rialb	C2.6.1	2,904.00 €	4.80
Vall de Rialb	C2.6.2	1,404.81 €	4.30
Vall de Rialb	C3.6.1	612.96 €	2.00
Altres UP	C3.7.1.1 & C3.7.1.2	2,674.43 €	9.10
Altres UP	C3.7.2.1 & C3.7.2.2	980.62 €	1.51
-	Total	45,345.26	88.45

* Forest stands where implementations were already made in the past but has been monitored within the project.

2.3. Economic benefits of implementing the actions (forestry exploitation)

Of the various actions (C1, C2 and C3), only action C2 generated sales of timber that could be transported for industrial transformation. Comparing the extraction and transport costs and the obtained revenues of the timber, it is possible to calculate the economic balance of the process and show some examples of the economic results of this type of forest stands. The economic balance is shown in Table 3.

It must be considered that the selected stands were selected because of its low management interest. Also, the economic revenues are calculated based on tons of extracted wood and the market prices in 2019 without taxes.

Table 3. Costs and revenues of extracting timber from each stand for sale to industry (considering no taxes).

LU	Stand	Area (ha)	Revenues from the sale of timber (€/ha)	Costs (€/ha)	Balance (€/ha)
Serres d'Ancosa	Marimon C2.3.1	4.4	1,600.50	2126.58	-526.08
Capçaleres del Llobregat	Vallcebre C2.5.1 & C2.5.2	3.6	710,09	648.46	61.63
Vall de Rialb	Confós C2.6.1	4.8	1,672.08	2511.46	-839.38
Vall de Rialb	Sardanyés C2.6.2	4.3	1,419.01	1129.34	289.67

2.4. Number of forestry owners

During the stand selection stage and the signing of agreements (action A2), 25 stands were identified as suitable for implementing the measures (actions C1-C2-C3), involving a total of 24 forestry owners. The ratio between the area of land involved and the number of owners was more or less the same, apart from the Capçaleres de Llobregat LU where ownership is very fragmented and it was necessary to bring together a number of owners in order to obtain stands with the minimum surface area for treatment. The stands located in other LUs are those represented by the fewest owners, as these were added later in order to ensure that the most innovative forestry treatments could be implemented (agroforestry plantings), and these areas were more suitable for this than the landscape units previously identified. Table 4 shows the forestry properties in each landscape unit (LU).

Table 4. Number of forestry owners per landscape unit

Forestry owners per LU		
LU	Number	Percentage (%)
Aspres	4	16.67
Montmell	3	12.50
Serres d'Ancosa	4	16.67
Replans del Berguedà	3	12.50
Capçaleres del Llobregat	5	20.83
Vall de Rialb	3	12.50
Other LUs	2	8.33
Total	24	100.00

3. Indicators for assessing the impact of the project's communication actions

The communication actions implemented (actions E2, E3, E4, E5, E6 and E7) involved a number of formats to reflect the range of target audiences and the impact assessed is therefore different for each action. Although the message of each communication action had to be adapted for each audience, it was always based on communicating the benefits of sustainable forest management to improve and adapt forests for climate change, the concept of creating a voluntary climate credit market and transferring the results and experiences of implementing the project.

Seven hundred pamphlets were published and distributed in Catalan, Spanish and Italian, seven technical and scientific articles were published in forestry sector journals, two guides to forest management to mitigate climate change were prepared, together with two educational pamphlets and a catalogue. A roll-up banner for presentations was printed and six information panels were installed, four outdoors and two indoors. The project website received more than 4,667 visits, where files were downloaded, including technical, educational and methodological documents and catalogues.

Thirty-six information sessions and workshops were held, attended by 358 people, including forestry owners and managers, technical staff from private industry and public authorities, students and private entities. Twenty-seven meetings were held to promote climate credits to businesses and public and private entities. A promotional workshop for business was also organised and project members attended two events organised by businesses in order to promote climate credits. Meetings were held and oral presentations of posters made at 35 international events including conferences, congresses, meetings, workshops and symposiums in 5 different countries. The project was presented at international events to 3,671 people. Sixteen networking meetings were held with other projects and the committees of experts met 16 times to publicise the project, collaborate with other projects and help to determine how to replicate the project and set up the climate credits.

The communication actions had a significant impact, mostly meeting the impact indicators set, and in many cases exceeding the expected values. There has been interest not just from the partners in raising greater awareness of the project, our target audiences have also been responsive. Owners and managers have been keen to implement the project into their management systems, while businesses and other bodies have shown interest in participating in the voluntary climate credit market.

ACTION D5.2. STUDY OF THE POTENTIAL SOCIO-ECONOMIC IMPACT IN A SCENARIO WHERE THE CLIMATE CREDIT MARKET IS IMPLEMENTED

1. Introduction

To help plan the costs involved in implementing a forestry project for mitigation and adaptation to climate change (PROMACC), a table of costs for the various actions has been prepared, which must be taken into account. The table shows the costs in two phases. The first is a theoretical study of the cost of implementing a PROMACC on a 50 hectare site based on the pilot studies carried out. The second is based on the real costs of applying various PROMACCs and some estimates based on the experience and work done by the project group.

The planning, preparation and implementation of a PROMACC involves different actions: raising awareness, preparing the PROMACC, implementation, securing funders, training and

monitoring. Each action type has an associated cost. The final cost of implementing a PROMACC is the sum of the cost of each action, plus VAT at 21%. The costs in the second phase are based on those incurred implementing the Collserola, Vall de Lord, Muga Valley and AFG Arenes PROMACCs, the 4 projects for which most information could be extracted.

To compare the implementation costs of the different PROMACCs on an equal basis, the average travel distance to the stands was assumed to be 80 km.

The costs of meetings with owners, selection, diagnosis and inventorying of stands, calculating the impact of ecosystem services (carbon, water and biodiversity) and the drafting of documents are based on the real costs of the actions carried out for each PROMACC. The information has been compiled on the basis of the time spent on each action plus related travel costs. Supervision and forestry work costs are estimated by the forestry work companies in each area, excluding VAT. The remaining actions are being carried out or planned, and the cost associated with them is based on a forecast of the volume of work and our experience of completed works.

The costs associated with drafting the budgets are based on visiting approximately 3 stands in a working day. It is estimated that each stand will be visited three times for monitoring and certification. One working day per stand will also be required, with associated travel costs, to secure funding entities. This includes time spent identifying potential companies and holding meetings. An average of two days training is estimated for the forestry operators, to explain the aims of the project and the criteria for the forestry works. Two hours of office time and one hour per stand are estimated for the installation of information panels in the forest. This action is carried out at the same time as the first monitoring visit to the stand. An estimated two working days will be required for the public awareness-raising activities carried out in each PROMACC area to explain the project's aims and the work to be done. Finally, we estimated the cost of a monitoring visit to one in two stands after five years.

The number of field visits to monitor the project and the number of posters and awareness-raising sessions is likely to be greater for stands located in areas that receive high numbers of visitors. Monitoring and training are carried out by public authority officials.

2. Assessment of the costs of a PROMACC

Table 5 sets out the real and planned costs (indicated by the “*” symbol) for the PROMACCs implemented in Collserola, Vall de Lord, Muga Valley and AFG Arenes and the cost study for the two phases described, and the percentage increase or decrease in the cost between the two phases.

Table 5. Execution costs for the PROMACC actions being implemented (in blue), proposed costs for the first and second phases (in green) and the percentage change between the first and second phases (in yellow). The expected costs are indicated with an asterisk (*).

	Costs of PROMACC implementation (€/ha)				Cost study (€/ha)		Variation
	Collserola	Vall de Lord	Vall de la Muga	AFG Les Arenes	First phase	Second phase	%
PREPARATION OF PROMACC							
ATTRACTING PARTICIPANTS	44.85	21.52	9.35	13.07	46.08	22.2	-51.83
Meetings with owners and other agents	23.96	19.37	5.17	2.88	17.28	12.84	-25.67
Selection of stands	20.89	2.15	4.17	10.19	28.8	9.35	-67.53
PREPARATION OF PROMACC	73.61	53.24	62.64	36.7	134.4	57.05	-57.55
Stand diagnosis and inventories	36.62	35.56	35.74	15.2	105.6	30.78	-70.85
Field visit to estimate the budget	16.05*	8.49*	8.34*	6.55*	14.4	10.36	-28.03

Calculation of impact on forest ecosystem services	7.28	2.38	3.51	3.93	9.6	4.28	-55.45
Drafting of PROAMCC and administrative documents	13.65	6.81	15.05	11.02	4.8	11.63	142.3
IMPLEMENTATION OF PROMACC	2877.23	2846.91	87.61	2521.05	2473.6	2748.40	11.13
Forestry work management (tree marking and work monitoring)	338.13	252.63	-	121.43	158.4	237.40	49.87
Forestry work	2478.68	2526.34	-	2321.07	2200	2440.03	11.00
Monitoring and final certification	60.41	67.93	87.61*	78.55	115.2	69.48	-39.69
SEEKING FUNDING ENTITIES	37.86	22.64	29.2	19.64	24	27.34	13.9
Aimed at businesses/entities	37.86*	22.64*	29.20*	19.64*	24	27.34	13.9
TRAINING	66.12	5.66	8.34	13.09	17.28	23.3	34.86
Aimed at forestry work companies	66.12*	5.66*	8.34*	13.09*	17.28	23.3	34.86
COMMUNICATION	35.13	9.06	12.86	17.03	50	18.52	-62.96
On-site (information panels)	6.37*	3.40*	4.51*	3.93*	10	4.56	-54.44
Awareness raising	28.76*	5.66*	8.34*	13.09*	40	13.96	-65.09
MONITORING	26.22	21.82	33.03	11.36	11.52	23.11	100.57
Post-treatment visit (at 5 years)	26.22*	21.82*	33.03*	11.36*	11.52	23.11	100.57
TOTAL PROMACC	3161	2980.85	-	2631.94	2756.88	2919.91	5.93
VAT (21%)	663.81	625.98	-	552.71	625.26	613.18	-
TOTAL TYPICAL PROMACC	3824.81	3606.83	-	3184.65	3382.14	3533.09	4.48

The costs of each PROMACC action differs notably between the two phases: the total cost based on the second phase is €2,920.42/ha, 7.03% higher than for the first. Although for the majority of actions the costs for the second phase are lower than for the first, tagging and forestry work were more expensive than initially estimated, by 49.87% and 11.00%, respectively. These are the most significant costs of a PROMACC and those that mainly determine the total cost of the project. They are also difficult to predict due to the differences between areas, masses and structures.

The cost of awareness-raising activities in the second phase was lower than in the first, in total, 51.83% less. The same is true for the actions involved in preparing the PROMACC, which cost 57.55% less, although the cost of drafting the documents increased by 142.30%. The overall cost of implementing a PROMACC increased by 12.35%, although the monitoring and certification costs were lower. The cost of seeking funding entities, training and monitoring are expected to be higher, by 13.90%, 34.86% and 100.57%, respectively. Communication costs, meanwhile, are expected to be 62.96% lower than initially budgeted.

It must be taken into account that the costs increase when the distances to be covered are greater, both to reach the PROMACC area and to move between stands. This is also the case for PROMACCs with stands that are more dispersed or difficult to access.