

LIFE MIDMACC

Mid-mountain adaptation to climate change

LIFE18 CCA/EN/001099

Project start date: 1 July 2019

Project duration: 5 years

**LESSONS LEARNED MANUAL BASED ON A
PARTICIPATORY PROCESS OF SYSTEMATISATION
OF THE EXPERIENCES DEVELOPED BY THE LIFE
MIDMACC 2022-2024 PROJECT.**

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Cite as

Sans F, Terrádez J, Pascual D, Pla E, García (2024) Lessons learned manual based on a participatory process of systematisation of the MIDMACC experiences on climate change adaptation. Deliverable 24 LIFE MIDMACC.

Executive summary

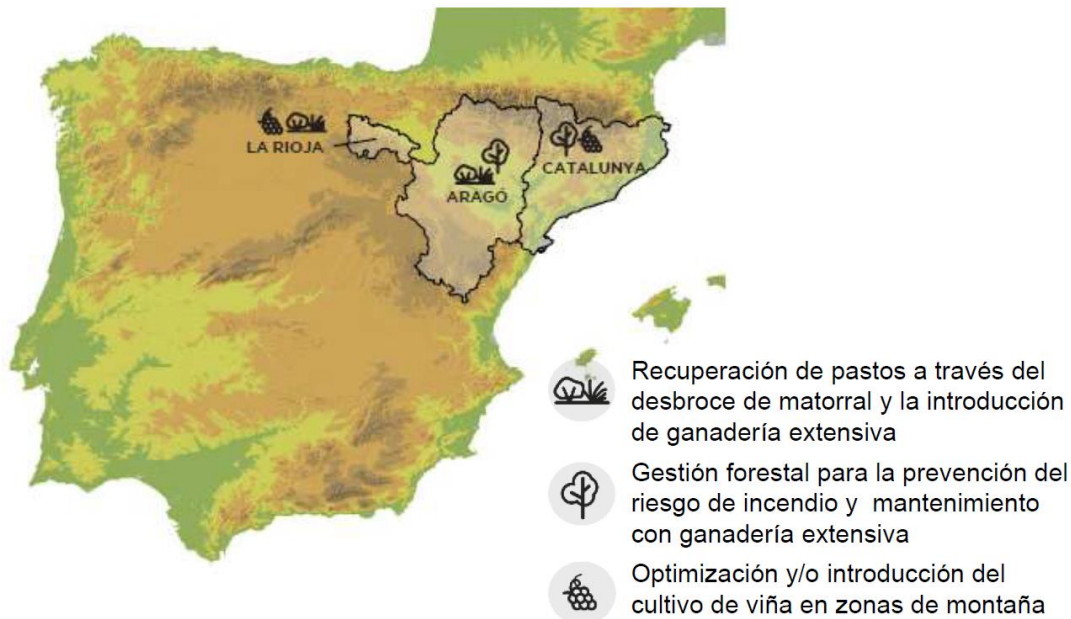
This manual is the result of a process of critical analysis by the LIFE MIDMACC project stakeholders involved in each of the project actions. Based on the identification of the successes and errors in the design and development of the 3 types of pilot experience (forest management, clearing and management of pastures and vineyards in mid-mountain), it has been possible to select the key elements and factors that have determined the achievement of the expected results in the pilot adaptation experiences in mid-mountain. This manual aims to be the final point of support for transfer and replicability, through the compilation of all the learning accumulated throughout the project. These lessons learned, organised by phases of implementation and target audience (livestock farmers, project technicians and public administrations) are a key deliverable aimed at facilitating the future replication of these practices in different mid-mountain contexts.

The document is structured in 7 sections. The first section consists of a brief summary of the project, with special attention to the description of the different pilot actions of the project. The second section describes the objectives of the handbook, as well as the methodology of elaboration and its different phases of development. The third section briefly describes the different target audiences that the lessons learned handbook aims to reach. The fourth section is aimed at facilitating the consultation of the information contained in the handbook. The fifth section is devoted to lessons learned and recommendations for project managers. The sixth section, on the other hand, presents the set of lessons learned and recommendations for technical staff and public administration managers. Finally, the seventh section highlights the recommendations and lessons learned addressed to productive actors.

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1. What is the LIFE MIDMACC project?

LIFE MIDMACC is a project that promotes adaptation to climate change in mid-mountain areas. It proposes landscape management and climate change adaptation alternatives with the aim of revitalising economic development in La Rioja, Aragon and Catalonia, focusing on three alternative landscape management measures:



Adaptation measures implemented and working areas of the LIFE MIDMACC project

The activities carried out during the project are briefly described below. For more information on the methodology or the results achieved, please consult the Guide "[Measures for adaptation to climate change in the Mediterranean mid-mountain region: a practical guide](#)".

Recovery of pastures in mid-mountain scrubland areas for the subsequent introduction of extensive livestock farming (Action C1).

Grassland restoration as a landscape management measure is based on an initial clearing of scrub followed by the introduction of extensive livestock farming. In this way, the aim is to recover the mosaic landscape. Thanks to its greater heterogeneity and discontinuities, this type of landscape is more resilient to fire risk, as well as to other threats typical of Mediterranean mid-mountain areas. Specifically, pilot tests have been implemented in two representative areas of the Mediterranean mid-mountain: in the Leza Valley in La Rioja, in the towns of San Román de Cameros and Ajamil de Cameros and in the experimental farm La Garcipollera in Aragón.

The different stages implemented have been as follows:

1. Mechanical clearing according to ecological criteria and introduction of sheep
2. Experimental design with plots subjected to different stocking rates
3. Monitoring of ecological and environmental parameters



Soils



Soil moisture



Infiltration and erosion



Pasture production and quality



Biodiversity of vegetation



Temperature and relative humidity



Rainfall

4. Socio-economic analysis of the implemented measure

Forest management for fire risk prevention and maintenance with extensive stockbreeding (Action C2)

Mediterranean mid-mountain forests are particularly vulnerable to climate change.

Adaptive forest management based on selective treatment of the undergrowth and thinning aims to promote fuel discontinuity in order to reduce the risk of forest fire, increase the generation of grasses and reduce water stress in the forest.

The pilot tests have been implemented in wooded areas representative of the Mediterranean mid-mountains, such as a forest of Norway spruce (*Pinus nigra*) and a poplar (*Populus nigra*) in the experimental farm La Garcipollera, in Aragon, and a holm oak (*Quercus ilex*) in the farm of Requesens (Alt Empordà) in Catalonia.

In order to evaluate forestry and livestock management as climate change adaptation measures, the following steps have been carried out:

1. Thinning and clearing of undergrowth and introduction of livestock according to rotational grazing criteria.
2. Experimental design with managed plots with and without livestock
3. Monitoring of ecological and environmental parameters



Soils



Soil moisture



Infiltration and erosion



Pasture production and quality



Biodiversity of vegetation



Temperature and relative humidity



Forest growth and condition

4. Socio-economic analysis of the measure implemented.

Optimisation of vine production and the introduction of vineyards in mid-mountain areas (Action C3).

One of the landscape management measures is the promotion of vineyards in mountain agriculture. Through the conversion of scrubland areas into vineyards and the adaptation of agricultural practices to the effects of climate change, an environmental and socio-economic improvement of agriculture in mid-mountain areas will be achieved.

Five pilot tests covering different environmental conditions and different agronomic practices have been implemented to determine which are the determining factors for the adaptation of this crop in the mid-mountains. In Catalonia, in the vineyards of Celler Cooperatiu d'Espolla, the Mas Marès d'Espelt Viticultors estate (Roses) and Llivins (Llívia) and in La Rioja at the Dinastía Vivanco (Tudelilla) and Monte Laturce (Clavijo) wineries.

The objective is, on the one hand, to improve the adaptation of mid-mountain areas to climate change and, on the other, to determine which practices best contribute to vine cultivation in these areas and what limitations they may present. To this end, the following steps have been taken:

1. Design of experimental plots with different agronomic management practices and vineyard planting time
 - Ground cover
 - Terraces and slopes
 - Trellis and glass
 - Implementation time
 - Vineyards at altitude
2. Monitoring of eco-environmental parameters



Soils



Soil moisture



Infiltration
and
erosion



Vineyard quality and
productivity



Soil biodiversity

3. Socio-economic analysis of the measure implemented.

Scaling up of climate change adaptation measures at regional level through river basin modelling (Action C4)

Mountain areas play a key role in water production and supply. The decrease in precipitation and the increase in temperature due to climate change, together with the increase in forest masses due to changes in land use, are causing an increase in water stress in mid-mountain areas, with a consequent decrease in water flows and a reduction in water availability.

In order to predict the possible evolution of water resources and forest stands, and to understand the effects of land management practices under different climate change scenarios, the results obtained in the pilot tests were scaled up in the river basins of the Aísa valley (Aragon), and the Anyet (Catalonia) and Leza (La Rioja) rivers.

To this end, an ecohydrological model has been developed, calibrated and validated using historical data. Different future scenarios were then designed, combining climate change scenarios with land use change scenarios, assessing the impact of these scenarios on the possible evolution of flows (water resources) and vegetation conditions in the three basins studied (Leza, Aísa and l'Anyet). The scenarios of change of use have been generated ad-hoc for the project, scaling up the experimental plots of pasture recovery and forest management at basin level.

Subsequently, with all the information collected, processed and validated, efforts were focused on understanding the changes that have occurred in the territory in recent decades at the landscape level and the evolution of land use. In a second phase, the model was run to obtain estimates of the future hydrological evolution of these basins under the hypothesis of applying the management measures proposed in Actions C1 and C2, and considering the most plausible climate change scenario (RCP 4.5).

2. Why and how has this handbook been produced?

The Pyrenean Climate Change Observatory (OPCC) of the Working Community of the Pyrenees (CTP) is responsible for the transferability and replicability action (Action C6) of the LIFE MIDMACC project, in the framework of which it has produced this lessons learned manual.

The transfer seeks to improve the development of the project and is implemented as a continuous process throughout the project, aimed at benefiting all parties. The transfer and replicability plan, drawn up at the beginning of the project, proposed a series of actions and documents that feed into this process, aimed at ensuring the desired impact and catalysing transferability to other mid-mountain territories facing similar problems.

Thus, this manual is the result of a critical analysis process by the LIFE MIDMACC project stakeholders involved in each of the project's actions. From the identification of successes and mistakes, it has been possible to select the key elements that have allowed the achievement of the MIDMACC project results. This manual aims to be the reference document to support transfer and replicability, gathering the lessons learned throughout the project to share them as lessons learned, thus contributing to facilitate the future replication of these practices in relevant contexts.

A lesson learned is defined as a synthesis of knowledge or understanding resulting from a positive or negative experience that can be used in other contexts and/or replicated.

The process of producing the handbook has been divided into different phases:

- 1) Documentary review of the deliverables, methodological documents and other documents of interest produced by the project partners for each of the 4 pilot experiences: 1) pasture recovery through scrub clearing, 2) forest management and extensive livestock farming with a regenerative perspective, 3) agronomic practices and introduction of vineyards in mountain areas and 4) use of an ecohydrological model to spatially scale climate change adaptation measures at basin level.
- 2) Group workshops with LIFE MIDMACC project partners and focused on each of the project actions, with the aim of reconstructing the implementation process and identifying a first list of lessons learnt from the project managers' perspective.
- 3) Workshop of the Supra-Regional Working Group with project partners and actors of the Regional Committees, with the aim of reaching consensus and prioritising the recommendations for replicability of the pilot experiences developed within the framework of the project and identifying their interest according to different target audiences.
- 4) Interviews with actors in the productive sectors, aimed at complementing and contrasting the learning previously identified.
- 5) Workshops with Euro-Mediterranean actors (Greece, Italy and Portugal), within the framework of the collaboration agreements signed and aimed at presenting the lessons learned, contrasting their validity in contexts with similar problems and defining the mechanisms to facilitate their replication.
- 6) Final workshop to present the Manual with all LIFE MIDMACC project partners, with the actors directly involved in the development of the pilot experiences, and with the local and regional actors involved in the project to encourage the replicability and use of the manual.



Representatives of the Working Community of the Pyrenees (CTP) and Euromontana

Final LIFE MIDMACC webinar on replicability and transferability,
26 April 2024



"From what I heard this morning, I am sure that other regions will be very interested, especially in the manual, which I think is a very interesting tool, especially for mid-mountain regions like Romania, where the climatic conditions can be very similar to those in the Pyrenees. So I think this kind of tool is very interesting, especially for the livestock and pastoral sector. So we will be happy to share the manual, especially in our network". (Euromontana).

Euro-Mediterranean actors



Greece, 19 February 2024

"It is a very good and detailed manual, and it will help us to design and replicate some of your actions here in Greece."

PROCESS OF STAKEHOLDER PARTICIPATION IN THE LIFE MIDMACC PROJECT

In the LIFE MIDMACC project, two bodies have been created specifically to ensure and dynamise the participation of the different actors. The Regional Committees, one per territory (Catalonia, La Rioja and Aragon), and the Supra-regional Working Group.

The Regional Committees are made up of more than a hundred stakeholders, continuously informed about the project and invited to annual meetings, usually at the end of the year. Four meetings of the Regional Committees have been held in November-December 2019, November 2020, February and March 2022 and 2023.

The Supra-Regional Working Group is made up of 13 actors from the three territories, representing the different areas of specialisation and institutions competent in the field in the 3 territories. Four meetings have been held during the project, following the meetings of the Regional Committees, in February 2020 and 2021, April 2022 and May 2023, in order to work on the basis of the results of the previous Regional Committee meetings.

The 2023 Supra-Regional Working Group was held in Zaragoza with 8 representatives from the three territories participating in the project: Catalonia, Aragon and La Rioja. This meeting was organised specifically for the elaboration of this Lessons Learned Manual.

The session consisted of two main blocks, after the initial presentation of the participants. The first block included the presentation of the lessons learned and recommendations for replicability developed by the project. The participants were able to contribute and validate the initial proposal by compiling, reducing and proposing a final list of 10 recommendations for each of the project phases: preparation, implementation, follow-up, communication/transferability.

The second block included a presentation on the table of contents of the Lessons Learned Manual, to discuss different aspects of the Manual: the objective of the document, the best way to ensure its dissemination and the possible mechanisms for updating it, among other aspects.



Workshop of the Supra-Regional Working Group, 30 May 2023 in Zaragoza.

3. Who is this handbook for?

This lessons learned handbook addresses different target audiences:

- a) **Project managers of climate change adaptation measures:** this stakeholder profile corresponds to project technicians and technicians from public or private entities who want to formulate and develop a project for the design and implementation of climate change adaptation measures. They constitute the main target audience of this manual.
- b) **Productive actors in the forestry, livestock and wine sectors:** people directly involved in the management of their territories and who develop these actions in the context of their daily productive activity, while contributing to a positive impact on their environment in favour of climate resilience.
- c) **Technical staff and managers of public administrations:** people working in forestry, environmental, livestock or rural development departments of public administrations who promote territorial management practices and who can make financial resources available to ensure coherence with relevant and current public policies, especially those related to the fight against climate change and depopulation.

1st regional committee meeting in Catalonia, 29 November 2019



4th meeting of the Regional Committee in La Rioja, 9 March 2023



4. How to explore this Handbook and easily find the information intended for each audience?

The recommendations made are systematised in 4 main sections corresponding to the four phases of project development: i) **preparation**, ii) **implementation of actions**, iii) **monitoring and evaluation**, and iv) **communication and transfer**.

The manual is organised according to three different target audiences: a) project managers, b) productive actors and c) technicians and public administration officials.

The first part of the handbook (Point 5. Lessons learnt and recommendations for project managers of climate change adaptation measures) compiles the recommendations for project managers arranged by phase and by action, where appropriate.

Some recommendations also apply to the other two audiences; where appropriate, this is indicated in the recommendation itself. When a recommendation only applies to one of the 4 actions of the project, it is specified using the following coloured legend:



Recovery of pastures in mid-mountain scrubland areas for the subsequent introduction of extensive livestock farming (Action C1).



Forest management for fire risk prevention and maintenance with extensive livestock farming (Action C2).



Optimisation of vineyard production and the introduction of vineyards in mid-mountain areas (Action C3).



Scaling up climate change adaptation measures at regional level through river basin modelling (Action C4).

If the recommendation in question does not carry one of the colours described above, it applies to all actions of the project.

The second part of the handbook details specific recommendations for public administration actors and productive actors. In case the recommendation is common to project managers, reference is made to this audience in the description in the first part of the handbook.

The number of the recommendation does not reflect any hierarchy. All recommendations have to be considered at the same level of importance.

The handbook includes some practical examples from interviews with stakeholders involved in the LIFE MIDMACC project, which are highlighted in boxes. In addition, these also illustrate the recommendations associated with the example.

At the end of the Manual, there are four summary sheets on the four actions of the project, which aim to summarise the context, methodology and main results, as well as lessons learned and recommendations.

5. Lessons learnt and recommendations for project managers of climate change adaptation measures

5.1 Preparation phase of the measures

The lessons learned and recommendations for this preparation phase essentially revolve around three themes: **the involvement of stakeholders, the choice of pilot sites and the resources needed for action.**

Recommendations common to the 3 actions of scrub clearance, forest management and vineyard trials



P1. NETWORKING WITH STAKEHOLDERS TO GENERATE SYNERGIES AND SHARE OBJECTIVES

The process of establishing a dialogue channel with the public administration is more efficient when there are previously existing contact persons in the Department of the corresponding public administration. It is advisable to foresee an initial phase prior to the project in order to establish contacts with the competent administrations and to make the objectives of the project or the project proposal known.

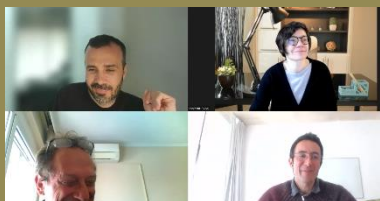
Similarly, it is important to integrate, from the preparation phase of the actions, all the stakeholders and interest groups of the territory likely to be impacted by the actions of the project (livestock farmers, forest owners, farmers, hunters, hikers...). To this end, it is crucial to carry out a mapping of the actors in each study area, where the different actors involved in one way or another in the study area can be identified and prioritised. In this sense, it is key to generate the space for dialogue that best suits each situation; bilateral meetings, participatory workshops, thematic workshops, etc.

....

In this way, we will be able to address their concerns adequately, as well as gain an insight into the expectations of the various stakeholders with regard to the project.

Another key point for the success of any adaptation initiative is to establish direct contact between the project and the producers. This relationship must be voluntary and take into account the producer's activity in order to adapt the pilot experience to "best practices" according to the area of intervention and type of farm.

Euro-Mediterranean actors



Greece, 19 February 2024

"Within the actors of the territory, it would be interesting to include and promote the beekeeping activity because of the positive interactions that bees can have with the improvement of biodiversity".

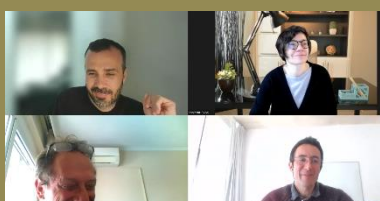
Euro-Mediterranean actors



Portugal, 23 November 2023

"This type of approach to science is very interesting because it allows producers to empower themselves with the language of science in order to be able to address public administrations in a proper way.

Euro-Mediterranean actors



Greece, 19 February 2024

"Perhaps we can include NGOs as a target audience. In Greece, large environmental NGOs are assisting in the elaboration and revision of environmental policies and laws and are an important supporter. They also manage some natural sites in collaboration with public authorities. It is good to take this into account and to involve them in the committees".

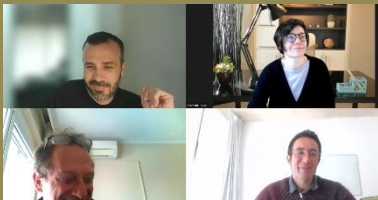
P2. DIAGNOSE THE PRIOR SUITABILITY OF EXPERIMENTAL SITES: PHYSICAL, ECOLOGICAL, SOCIO-ECONOMIC ASPECTS AND PRIOR DATA AVAILABILITY.

Common recommendation with productive actors

It is highly advisable to have a good prior characterisation of the territory where the actions are to be implemented. In this sense, it is important to plan time to visit the territory in order to choose the most suitable land and plots for the objectives of the project. These *on-site* visits are key to gain an in-depth knowledge of the environmental setting and the usual previous management practices, so that the actions can be designed to better respond to the real needs of the owners of the plots.




In order to generate pasture areas, it is recommended to carry out a prior analysis of the forest structure (tree and shrub cover), the herbaceous species present, soil characteristics and slope, etc., to assess the potential of the forest for pasture establishment.

<p>Euro-Mediterranean actors</p> 	<p>Greece, 19 February 2024</p>
<p><i>"It is also important to know and take into account the history of the sites, the historical land uses in the study area".</i></p>	


It is important to have detailed knowledge and data on the environmental diversity of the territory (climate, type of vegetation, nature of the soil, hydrology, etc.) where the actions are to be implemented. All these factors are key to choosing the ideal time for action, depending on the climate (number of hours of sunshine), altitude, type of vegetation, nature of the soil, current management practices and location of livestock, and availability of water.

Other relevant elements are the orientation and layout of the plots as well as the access conditions. Agricultural, maintenance and monitoring work will be carried out regularly over a number of years, so it is important to ensure easy access and even provide for the possibility of mechanising certain tasks to facilitate this work (e.g. automatic sensors for monitoring certain eco-environmental variables). The better the exposure, orientation and access to the chosen plots, the easier and more practical it will be for managers to monitor them, or for owners to carry out management practices (e.g. moving livestock). In this way, compliance with the monitoring plan will be guaranteed and significant travel costs will be avoided.


<p>Forestry technician</p> 	<p>CITA, la Garcipollera (Aragon)</p>
<p><i>"...Regarding the area chosen, it is the Garcipollera mountain, which is a public mountain. At the</i></p>	

end of the day, the most complex thing is, although it may not seem like it, to get the animals into the site. So, of course, the further away, the more complex it is to get them in. It may seem very simple, but it is not. In other words, you have the enclosure prepared, the plots, but then you have to put two cows in each plot and so many sheep, and it is not easy to respect the plan established on paper. That's why the area chosen was, within the whole forest, the closest possible to the farm itself...".


In our case, we take the cows on foot, you go with them and you have to take two cows to one place, two to another and two to another. Between all of us, the way we have it, the way you saw it and see it, it's all very well, but imagine if we had to take cows to, for example, the plot that was originally planned: we would have had to take them in a trailer, one cow per trip. It would have been very expensive both in terms of fuel and pollution. In this way and with the plots close to the farm and to each other, we have the animals very well directed. The sheep are the same. Even if there are a lot of sheep, we just take them here, less than 500 metres up the hill, unload them and that's it, the whole process is very viable. In one trip, bang! You just dump them there and it's easy".

<p>Euro-Mediterranean actors</p> 	<p>Italy, 17 October 2023</p>
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The slope of the plots is an important factor to take into account in regions such as the Aosta Valley, where slopes can reach 30-40%. In addition, if there is a lot of grass cover, the risk of slipping increases.

 Forest management interventions are discouraged on steep slopes as they have a higher risk of soil loss after treatment, which can be aggravated by livestock.

It is also important to take into account ownership (public, private, shared between several owners) as this can influence the availability of land for such experimental actions.

<p>Euro-Mediterranean actors</p> 	<p>Portugal, 23 November 2023</p>
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Another key issue is that socio-economic aspects should be addressed from the very beginning of the project, from the very approach of the actions in the different plots. Therefore, the question of the benefits of implementing these actions from an economic point of view must be included at an early stage. This is a clear priority.

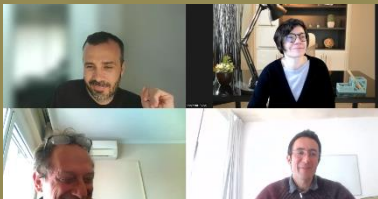
P3. BE AWARE OF BUREAUCRATIC TIMEFRAMES AND ANTICIPATE THEM.

The implementation of experimental activities such as those promoted by LIFE MIDMACC requires requests for authorisations and administrative procedures with the competent administrations and productive actors involved. It is important to anticipate these formalities and to foresee time dedicated to these procedures at the beginning of the project.



The cultivation of vines is governed by the Ministry of Agriculture. Planting new vines requires prior authorisations from them and may lead to difficulties and/or significant delays in obtaining planting rights.

<p>Euro-Mediterranean actors</p> 	<p>Italy, 17 October 2023</p>
<p>Historically, in the Aosta Valley, vines were not grown in meadows. They cultivated vines in places where nothing else could be cultivated. For this reason, these are often places that are difficult to access and unstable in terms of natural risks such as rock falls. Reclaiming these abandoned vineyard areas to plant new vines requires geological risk studies, which can be costly and time-consuming.</p> <p>Some vineyards are now in areas that are off-limits to the public. Winegrowers go there at their own risk. And it is very difficult, if not impossible, to obtain European subsidies for areas that are off-limits to the public because they are in high-risk areas.</p>	


<p>Euro-Mediterranean actors</p> 	<p>Greece, 19 February 2024</p>
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In Greece, most of the natural areas are large, public, national forests or pastures. It is necessary to think about how to adapt, replicate and scale up LIFE MIDMACC actions that have been carried out in private experimental sites, to larger and generally public areas.

P4. ADAPT THE SIZE OF THE EXPERIMENTAL PLOTS TO THE SIZE OF THE PROPOSED PROJECT, INVOLVING LOCAL STAKEHOLDERS.

In the preparation phase, it is important to make sure that the size of the experimental plots is adequate to assess and monitor key variables (soil typology, plant diversity and plant communities). If the plot is too large, this may make subsequent monitoring difficult. If it is too small, difficulties may arise in monitoring all the variables of interest in the project, or bias the representativeness of the sample.

Therefore, a balance has to be found between the size and ambition of the tests and pilot actions, and the management capacity of the actors involved. Designing an experimental plot too large can lead to great difficulties in subsequent management.


<p>Livestock</p> 	<p>Comarca del Camero Viejo (La Rioja)</p>
<p><i>"The clearing was organised and stipulated by the project. After the clearing, some medium-low scrub was left on each plot, which served to shade the animals in summer. The initial action was simply to organise the material to prepare the enclosures. For this and other activities linked to the pilot plots, the advice of the project managers to the farmer is important.</i></p> <p><i>The farm on which we worked is 100m², and the experiments have been carried out on half of the plot. It is important to choose the best plot, the most suitable for experimentation with herbaceous vegetation and to have basic initial information to select the best plots. In our case, initial information on soil quality was available. Additional information was provided by pre-existing rainfall records and information on the frequency and time of grazing on each plot.</i></p> <p><i>It is also important that the materials and fencing to be installed for the pilot study are usable and useful to the farmer beyond the life of the project.</i></p>	


P5. CONSIDER LAND OWNERSHIP NEEDS AND CONTINGENCIES IN THE PREPARATION OF BUDGETS.

Common recommendation with productive actors.

It is very important to make the design of the different actions as detailed and complete as possible. In this way, the planning of the actions is more detailed and allows us to better size the budget necessary to cover the new needs that may arise for the owners (e.g. fencing, water tanks, etc.).

It is essential to take into account the real needs of the property, given that part of the instrumentation and elements necessary for the actions will remain as investments in the plot once the project is completed. In this way, in addition to the action itself, the project contributes to the acquisition of materials that will be useful for the operation in the short and medium term. This is also a decisive factor in the acceptance of the measures and commitment to cooperation on the part of the producers. It is also advisable to take climate change scenarios into account in the design and implementation of the facilities.

<p>Euro-Mediterranean actors</p> 	<p>Portugal, 23 November 2023</p>
<p>It is important that the costs of the instrumental implementation of the pilot cases are taken into account at the budgetary level from the outset.</p>	

<p>Forestry technician</p> 	<p>CITA, la Garcipollera (Aragon)</p>
<p><i>"In the preparation phase of the experimental plots in Garcipollera, I made a clear proposal. They (IPE-CSIC) had a concept, but I was clear about what the infrastructure had to be like for the pilot case they were proposing to be effective, because I know the area well. The materials had to be chosen well so that the necessary fencing would be durable and would last not only for the four years of the project; my intention is to give it continuity beyond the Life MIDMACC project. I intend to continue putting animals in there to see how it evolves or to be able to make the most of the work we have done there".</i></p>	

Specific recommendations for the scaling up of proposed climate change adaptation measures at regional level



P6. DIMENSION THE MODELLING APPROPRIATELY: RESOLUTION, DATA AVAILABILITY AND TIME CONSTRAINT.

Modelling for the scaling of measurements requires prior reflection and sizing: construction of the model, calibration, running of simulations, etc. Paying particular attention to defining the spatial resolution of the models is also key, given that the models require a lot of time and dedication.

It is difficult to have all the data at the level of detail required for representative modelling. Good soil mapping is therefore key, as modelling considers values for texture, organic matter, permeability etc...

It is necessary to take into account the limitations of modelling in the absence of detailed and reliable input data, and to work with the corresponding uncertainties and in a transparent manner.

It is therefore recommended that a rigorous analysis methodology be defined from the outset, documented and orderly, so that the modelling and scaling of adaptation measures is representative.

5.2 Implementation phase of the measures

The lessons learned and recommendations for this implementation phase are essentially articulated around three themes: stakeholder engagement, risk assessment and resources needed for action.

Recommendations common to the 3 actions of scrub clearance, forest management and vineyard trials



11. FORMALISE AN AGREEMENT BETWEEN THE ACTORS INVOLVED ON THE BASIS OF THE DEFINED IMPLEMENTATION PLAN.

Common recommendation with productive actors and technical staff and public administration officials

It is important to reconcile operational interests and needs with the scientific objectives of the actions on the one hand, and with the interests expressed by the livestock farms on the other hand. In this sense, it is recommended to confirm the agreement of stakeholders on issues such as the time of the year to allow livestock grazing, or the number of grazing days and livestock required (grazing intensity).

The support and involvement of farm staff and production actors in general (producers, farmers and herders) is essential to achieve good results throughout the implementation of the projects. In this sense, organising training programmes for farmers or awareness raising campaigns on the different experimental practices (e.g. to carry water tanks) or monitoring techniques (e.g. experience with irrigation sensors) are useful measures that help to motivate and ensure farmers' commitment.

The aim of an agreement between project managers, production stakeholders and administrations is to anticipate this type of problem. By way of example, an agreement between the parties could be based on: a) actions to coordinate productive activity with public and private owners; b) awareness-raising and training of personnel to reconcile the needs and interests of all parties; c) regular information actions on the progress of the objectives, results and commitments made in relation to the experiments, as well as the corresponding regulatory framework.

12. ASSESS RISKS AND PROVIDE FOR COMPATIBILISATION MEASURES TO AVOID THEM, INCLUDING COMPENSATION TO PRODUCTION STAKEHOLDERS IF NECESSARY

Common recommendation with productive actors

During the years of an experiment's operation, many situations may arise that may jeopardise the action or generate important interferences for its good implementation. For example, it is necessary to foresee how to avoid negative interactions between livestock and wildlife (presence of bears, wolves or other wildlife) both in terms of damage to livestock and negative impact on wildlife populations.

The risk of the experimental activities decreasing the production of the plot, in case things do not go as planned, must also be taken into consideration.

In fact, many environmental measures generate benefits that currently have no market value (in the short or medium term) and, on the other hand, their implementation may entail an additional cost

that nobody is initially willing to assume. It should be remembered that some of the measures tested are in the experimental phase, and although theoretically they have a controlled risk, they may involve some kind of damage at some stage of their implementation.

For all these reasons, actions such as those developed by LIFE MIDMACC should foresee and define compatibility measures with the actors involved and/or possible compensation in the event that the experimental practices of adaptation to climate change have a negative impact on the profitability of farms.

13. ENSURE THE INVOLVEMENT OF LAND MANAGERS AND THE PRODUCTION SECTOR TO FACILITATE THE CHANGE OF MANAGEMENT MODEL TOWARDS REGENERATIVE LIVESTOCK FARMING.


Common recommendation with productive actors and technical staff and public administration officials

On the other hand, it is necessary to explore formulas that strengthen the continuous liaison of the parties involved with the plan (I1) and to guarantee the necessary involvement of public administrations and private livestock farmers in order to design and carry out the actions adequately.

On the other hand, in the implementation phase, the collection and dissemination of results must be kept in mind with a view to demonstrating the feasibility and interest of the actions.



In terms of clearing actions, regenerative stockbreeding is based on using high stocking rates for relatively short periods of time combined with long periods of pasture rest in order to ensure soil productivity, soil quality and animal welfare. A shift towards this management model is recommended in order to gradually restore forage potential and delay scrub regeneration. Rotational management of livestock can be done by forcing their movement with the help of fencing and by organising pastures to plan periodic rotations.


<p>Livestock</p> 	<p>Comarca del Camero Viejo (La Rioja)</p>
<p><i>"Within the same municipality, the implementation of the experimental plots has aroused some curiosity, but not too much. Although a priori it may seem strange to the local people or to other farmers who were there doing rotations, the quality and quantity of the pasture has improved substantially in the treated plots. Logically, I am taking advantage of these practices and I am also inviting other farmers to adopt them as well. But there are older farmers, about to retire, who have done things the same way all their lives. I don't want to complicate things for them and I don't want to complicate my life".</i></p>	

14. MAINTAINING PASTORALISM AS AN ESSENTIAL ACTIVITY FOR CLIMATE CHANGE ADAPTATION

Common recommendation with productive actors and technical staff and public administration officers

It is imperative to support the maintenance of pastoralism as an essential activity to ensure adaptation to climate change.

All these activities and their maintenance are conditioned by the presence of herders: without livestock and herders, it is not possible to implement the actions and their continuity to maintain a more resilient landscape.

<p>Livestock</p> 	<p>Comarca del Camero Viejo (La Rioja)</p>
<p><i>"It is important to transmit that the farmer has a fundamental role and that his work is key to adaptation, to transmit this added value of extensive livestock farming to the competent administrations. At the same time, this generates expectations among producers, who expect the project to have a positive impact on the competent administrations".</i></p>	

Specific recommendations for scaling up proposed climate change adaptation measures at the regional level



15. ENSURE TECHNICAL AND HUMAN RESOURCES FOR THE DEVELOPMENT AND IMPLEMENTATION OF MODELLING.

The use of ecohydrological modelling tools makes it possible to estimate the effect of different land management measures by combining multiple biophysical variables. An a priori validation of a model that has been extensively tested in other mountain areas does not ensure low uncertainty in the modelling, and prior calibration is necessary in order to obtain results that are as representative as possible.

In order to carry out a valid and representative modelling of reality, it is necessary:


- Have a person dedicated to modelling, who owns and masters the software of the chosen model.
- Know, take into account and communicate all sources of uncertainty (model, methodology, analysis, knowledge of the study area or observed data and future climate scenarios).

16. HAVE PRIOR KNOWLEDGE OF THE TERRITORY AND OF THE LOCAL AREA, BOTH OF THE GLOBAL CONTEXT AND OF THE RESULTS OF THE EXPERIMENTS

Defining the model as representatively as possible requires a lot of data. These are the guarantee of reliable results, which can be a solid support for decision support.

This knowledge of the territory includes:

- To have climatic and hydrological data for the study area (flows), with homogeneous data series, with a minimum time coverage of between 5 or 10 years, without gaps or extremes. This is essential to ensure a good calibration of the models. Only in this way will a representative scaling of the measurements be possible.
- Rely on the expert knowledge of local people, both for the calibration and for the use of the model, in order to be able to contrast the results of the simulations.
- Be aware that the elaboration of the adaptation scenarios to be generated does not present as many technical difficulties as "strategic" ones, especially with regard to the choice of land use changes introduced in the model.

<p style="text-align: center;">Euro-Mediterranean actors</p> 	<p style="text-align: center;">Portugal, 23 November 2023</p>
<p>It may be worth considering technical training workshops (especially for project managers, but also for technical staff of public administrations) to ensure that the people carrying out the modelling make as realistic a representation as possible of the basin to be modelled.</p>	

5.3 Monitoring and evaluation phase of the measures

The lessons learned and recommendations for this phase of monitoring and evaluation are articulated around the necessary means for a monitoring adapted to the objectives. All the recommendations are common to the 3 actions of scrub clearance, forest management and vineyard trials of the project.

S1. USE LIDAR (LIGHT DETECTION AND RANGING) TECHNOLOGY OR PHOTOGRAMMETRY FOR EROSION MEASUREMENT USING DRONES.

The equipment and technology used for rainfall simulations can be a barrier to replicability as working with rainfall simulations is costly and time-consuming. The use of new technologies such as drones can be a good alternative for measuring infiltration and erosion.

However, it is also a measure that requires resources: specialised personnel to fly the drones, experts to interpret the images, high-resolution instruments and the capacity to analyse a lot of data.

S2. INSTALLING AUTOMATED SYSTEMS TO MEASURE SOIL MOISTURE

To improve the monitoring of environmental variables, it is recommended to use automated systems whenever possible. For example, it may be interesting to provide for automated measurements every 10 minutes to measure soil moisture with probes and dataloggers and to be able to work telematically with the data.

Euro-Mediterranean actors



Italy, 17 October 2023

In the Aosta Valley, 2 cooperatives have recently installed rain gauges that send information directly to the winegrowers' mobile phones.


S3. DEDICATE SUFFICIENT HUMAN RESOURCES AND TIME TO ENSURE RELIABLE DATA COLLECTION.

The monitoring network for this type of action can be complex: it involves a lot of resources and staff availability. The human resources required for monitoring can be a constraint to replicability if they are not well foreseen. This is a key aspect that should be integrated and budgeted for from the project design stage and taking into account the total duration of the project.

S4. CHOOSE FEW VARIABLES, BUT VERY SIGNIFICANT AND REPRESENTATIVE OF WHAT IS TO BE MEASURED.

As an improvement of the monitoring network, it is recommended to choose appropriate monitoring variables focused on the objectives (what kind of monitoring exists, time that can be devoted, available means...). It is therefore preferable to focus the monitoring of the plots on a few variables,


but which can be correctly followed throughout the life of the project and beyond, with the technical and human resources available, rather than to opt for exhaustive monitoring that is impossible to maintain over time.

<p>Livestock</p> 	<p>Comarca del Camero Viejo (La Rioja)</p>
<p><i>"Previous soil analyses have determined the best location for the experiments and the equipped pilot plot. This analysis was carried out at the beginning of the project. I was not involved in the choice of the monitored variables".</i></p>	

S5. PROVIDE MEANS OF MONITORING THE INSTRUMENTATION AND THE SITE TO PREVENT VANDALISM.

It should be borne in mind that problems linked to the maintenance and continuity of the equipment installed in the field can always arise (the passage of a tractor or a wild boar that destroys the sensor; the simulation material can break...), so we must be prepared, if necessary, to adapt the monitoring accordingly (protocols, sensors...).


It is recommended that the human and economic resources to be dedicated to monitoring the proper functioning and condition of the experimental plots be adequately sized. It is recommended to explore the possibility of working on a private farm that can more easily guarantee the protection measures.

<p>Forestry technician</p> 	<p>CITA, la Garcipollera (Aragon)</p>
<p><i>"This is what happened to us last year. We have a guy who still hangs around here, who takes the chains off the access gates to the plots of the LIFE project. But not only from LIFE, but from our fences, from our private use. The first time, look how silly it was, in the Pinar area the gates were locked with a chain and a carabiner. Nobody thought there was anyone who would take the chains. Well, they took them. But not only did they take them, they left the gates open. Thank goodness there were no livestock inside or around, as they could have gone into plots of land where they didn't belong, spoiling the experiment. After this, we bought chains and padlocks, but the guy came back and cut the padlocks with a shears and took them away again. Now what we are doing is tying the doors with ropes. The rope doesn't interest him and so far he hasn't opened the doors".</i></p>	

S6. STRATEGICALLY SELECT THE LOCATION OF ACTIONS BASED ON EASE OF ACCESS AND POTENTIAL EXPOSURE TO VANDALISM.

It is necessary to take into account that the difficulties or ease of monitoring will depend a lot on the location of the plot (access, slope, distance...). Easy access facilitates monitoring actions, but increases the chances of vandalism.


Access should be carefully assessed and the least susceptible sites (whether on public or private land) should be chosen. It may also be advisable to assess the relevance of information signs, as they can be counterproductive.

Euro-Mediterranean actors	Italy, 17 October 2023
	
<p><i>There is no vandalism in Valle d'Aosta, but there are some problems with wildlife (birds, wild boar, deer, etc.), which is becoming more and more important.</i></p>	

S7. SEEK FUNDING AND MEANS TO ENSURE CONTINUITY OF THE EXPERIENCE AND LONG-TERM FOLLOW-UP

It is important to keep a long-term vision and anticipate future monitoring of the experimental plots beyond the life of the project, as some performance indicators may take several years to manifest themselves in a meaningful way.

It is therefore essential to seek synergies with other projects or initiatives that can sustain the efforts made over time; the involvement of actors, public or private, must also clearly pursue this aim.

Forestry technician	CITA, la Garcipollera (Aragon)
	
<p><i>"I would find it very sad if there were no continuity in a project where the most important data will be collected not in four years, but possibly in the long term. Look, I'll give you an example of an area where gorse (<i>Genista scorpius</i>) predominates. We have been installing and monitoring an exclusion cage for more than 20 years. Although it is not exactly the same, it is very similar to what is being done here with the MIDMACC project. In this area, which has a totally closed fence and is inaccessible to domestic and local fauna, the evolution of the shrub, tree and vegetative biomass has been tremendous, especially many years later".</i></p> <p><i>"That's why I say that this type of project has to find continuity. I don't know how, but projects of this magnitude should be given continuity, because they are very interesting and the most significant results are obtained after many years".</i></p>	

S8 . TAKE INTO CONSIDERATION VOLUNTEER PROGRAMMES FOR FOLLOW-UP

Volunteering can be a complementary channel to monitoring tasks, provided that rigour in the execution of the work can be guaranteed and adequate training is offered to volunteers. Their participation would also amplify the potential for raising awareness and knowledge of the problems and possible measures for adaptation to climate change.

Euro-Mediterranean actors	Portugal, 23 November 2023
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"One idea to get the most out of monitoring and evaluation data can be to develop a simple application, which keeps track of simple variables and is easily interpreted by producers to get the most out of it. It is key to look for a "friendly" format for such applications. This type of product can act as a "reward" for farmers for their contribution to continuous monitoring programmes on their farms..."

Forestry technician



CITA, la Garcipollera (Aragon)

"The IPE had a very clear programme and approach for the experimental plot in Garcipollera. We (CITA) have tried to adjust to them as far as possible. It is true that, from time to time, we have had to ask them to speed up some of the samplings, so that we could introduce the animals in the appropriate period and not alter the dynamics of the farm. That is to say, for example, if in June we take all the animals up to the port, to the mountains, we need the control of the flora not to be delayed too much in order to introduce the animals and then be able to release them. If not, we are forced to keep the animals in the lower part for a longer period of time, with all the prejudice that this may entail. Fortunately this has not been the case, except this year, when there was a slight delay, but nothing more? Has it been solved? Yes, it has been solved.

Euro-Mediterranean actors

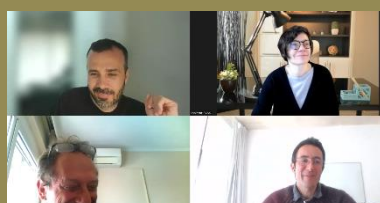


Italy, 17 October 2023

"In the Aosta Valley, there is already a well-established network of weather station monitoring managed by the 11 cooperatives in the area, which communicate the data to the winegrowers to improve vineyard management".

"One of the problems of having many small plots with different owners is the difficulty of keeping good records of monitoring data. New winegrowers, generally younger, have adopted a new approach, trying to work on larger areas to facilitate the establishment and monitoring of the holdings".

Euro-Mediterranean actors



Greece, 19 February 2024

"On the basis of simple monitoring parameters, it can be worthwhile to train producers to monitor the actions themselves after the end of the project. In order to achieve this, it is also necessary to convince them of the interest that such monitoring can have for their activity".

Specific recommendations for scaling up proposed climate change adaptation measures at the regional level



S9. AS THE MODEL MAKES FORWARD-LOOKING PREDICTIONS, IT WOULD BE USEFUL TO REVIEW THE RESULTS EVERY 5 YEARS, WHEN OBSERVED DATA BECOME AVAILABLE.

It is necessary and important to periodically check the modelling results, at least every 5 years and whenever new data become available, to confirm that the results are in line with the observed reality.


5.4 Communication phase and transfer of measures

The lessons learned and recommendations for this communication and transfer phase are essentially articulated around 3 themes: the context and situation related to climate change, the way to communicate and the resources needed to carry out the action. All recommendations are common to all 4 project activities.

CT1. TAKE ADVANTAGE OF THE FACT THAT ADAPTATION TO CLIMATE CHANGE IS A TOPICAL ISSUE TO DEEPEN THE DISSEMINATION AND KNOWLEDGE OF THE RESULTS.

Common recommendation for technical staff and decision-makers in [public administration](#)


Adaptation to climate change is a topical issue and it is possible to take advantage of society's receptiveness to promote adaptation actions. Opportunities can be sought to occupy media space and present the actions carried out in forums, focusing the discourse on exposing the problems to which they respond, the results obtained, the actors involved and the possible ways of replication.

<p>Euro-Mediterranean actors</p> 	<p>Portugal, 23 November 2023</p>
<p><i>"A key element is the receptiveness of society, which is closely linked to communication. We have to make sure that, in the eyes of society, extensive livestock farming is seen in a positive light".</i></p>	

TC2. TRANSFERRING EXPERIENCES FROM THE ADMINISTRATIONS

Common recommendation for technical staff and decision-makers in [public administration](#)

It is recommended, on the one hand, to communicate to society the interest of this type of actions and that the actors can act as ambassadors/witnesses towards political representatives. On the other hand, it is recommended that public authorities be encouraged to propose plans that facilitate the transfer of successful experiences of adaptation to climate change.

<p>Forestry technician</p> 	<p>CITA, la Garcipollera (Aragon)</p>
<p><i>"We have a lot of visits. At Garcipollera we do a lot of transfer in our own way, let's say, free of charge, because we are an experimental farm and we explain the projects in which we participate. For example, visits are made by students from the school of agronomists and teachers, technicians, researchers or research groups, as well as livestock associations from other areas. During the visits, we show them all the experiences we carry out, including those promoted by the LIFE MIDMACC project. This allows them to see in a short time many practical things that catch their attention."</i></p>	

Livestock



Comarca del Camero Viejo (La Rioja)

"It is important to reach out to the Environment Councillors and Directors General with competences in the livestock sector so that they read the reports and results of the projects carefully. It is also important to invite them to conferences, seminars..."

Representatives of the Working Community of the Pyrenees (CTP) and Euromontana

Final LIFE MIDMACC webinar on replicability and transferability,
26 April 2024



"The scaling up and replicability part requires a series of steps. The first is to establish direct contact. From the office we have more access, obviously, to the political leaders as the regional administration that we are, to explain these results to them and also establish alliances, because you know that in old Europe we have many administrative levels and it is important to establish institutional alliances between local administrations, between legislators, with the revenue of deputies, parliaments, technical and sectoral leaders, and also with the European Union". (Catalonia)

"What seems important to us about the lessons learned from the LIFE MIDMACC project is to be able, on the one hand, to integrate them into the implementation of a reference adaptation scenario at regional level, but also to be able to transfer them to the territories and provide, through the implementation of resource centres, databases, etc., possible adaptation solutions to the various project promoters." (Occitanie)

"We are working here on several projects, some of which affect climate change directly, but others more indirectly. I believe that all projects of this type should include a final deliverable that includes some kind of balance sheet specifying the concrete actions that each competent administration could take to take advantage of these conclusions. A concise document whose purpose and even title would be explicitly clear: Technical conclusions easily transferable to political life". (Navarre)


TC3. TAKE INTO ACCOUNT SOME BASIC CONSIDERATIONS, SUCH AS THE TERRITORIAL CONTEXT, IN ORDER TO SUCCESSFULLY COMMUNICATE RESULTS.

The basic considerations to be taken into account are:

1. Understanding the social and economic reality, as well as the needs of the actors in the territory.
2. The greater receptiveness of the results if they go hand in hand with the scientific field.
3. The availability of financial resources for communication tasks;
4. The target audience and their outlook, whether urban or rural.

This requires:

- Study in depth the social and economic realities, as well as the needs of the actors in the territory, as this can facilitate the implementation of actions.
- Keep in mind that farmers are very receptive to the results and comments of scientists and that they are aware of the need to preserve the mosaic landscape.
- Be aware that there is a growing tendency to see the forest from an urban perspective and as an untouchable pristine space.
- Provide sufficient financial resources for communication, awareness raising and transfer of results, taking into account the need to communicate beyond the end of the projects.

<p>Livestock</p> 	<p>Comarca del Camero Viejo (La Rioja)</p>
<p><i>"A critical point of the transfer is perhaps that the average age of extensive livestock farmers is relatively advanced, close to retirement, and they are not interested in changing their management practices. A suitable channel could be through local entities such as "Casa del ganadero". For example, in the pilot case of La Rioja, a livestock commission has been set up in the municipality to inform farmers about the conditions of the CAP and other relevant information. It would be an interesting channel to implement enclosures and work more in rotation with other winners".</i></p>	

TC4. COMMUNICATE IN AN INTELLIGIBLE WAY, IN A LANGUAGE ADAPTED TO THE DIFFERENT AUDIENCES THAT MUST MAKE DECISIONS BASED ON THESE RESULTS.

To facilitate the dissemination and transmission of the results it is recommended:

- Encourage the participation of producers in communication activities;
- Rewrite scientific results in an appropriate language that can reach different audiences;
- Having people specialised in communication to know how to disseminate the results and launch specific messages to reach a certain target audience (local entities);



- Disseminate the results of climate change adaptation scenario simulations among local stakeholders, showing the observed evidence and explaining plausible future scenarios, not forgetting the associated uncertainty, and always contrasting with stakeholders who know the context.



- In order to improve livestock management, it is recommended that both farmers and owners receive training on extensive regenerative and/or rotational livestock farming, as well as on silvo-pastoral techniques.

Forestry technician



CITA, la Garcipollera (Aragon)

"We should bring the Aragonese Minister for the Environment here. He has to be brought here. And you have to organise an open day at the end of the project. I think that the farm could be an important example, as it is managed by a powerful public entity, and we could organise an open day where we could even invite the Regional Minister to see the facilities and what we do at CITA, and at the same time present the Life MIDMACC project. More than anything, because they have a very busy schedule, so we have to maximise these visits. This is essential. As far as we are concerned, no problem. Why? Because we have the means to do it."

Representatives of the Working Community of the Pyrenees (CTP) and Euromontana

Final LIFE MIDMACC webinar on replicability and transferability,
26 April 2024



"For us, the most interesting thing is to have solid scientific results that are easy to interpret. Something that we can take to policy makers in a concrete way, but always in a simplified and synthesised form. That is really, I think, what is necessary for us to be useful politically and for the results to be disseminated without neglecting scientific rigour. This is the challenge" (Euromontana).

"In other words, as Euromontana rightly pointed out today, scientific data accompanied by recommendations, best practices, everything that has been presented today. In other words, as Euromontana has just pointed out, scientific data accompanied by recommendations, best practices, everything that has been presented today. Secondly, to also have materials that are easy for decision-makers to understand" (Catalonia).

TC5. LINKING ACTIONS TO THE PROMOTION OF OPPORTUNITIES IN THE PRIMARY SECTOR AND THE RURAL ENVIRONMENT.

Common recommendation with productive actors and technical staff and decision-makers in public administration

This recommendation stems from a number of lessons learned from the project on the need to:



- To reflect on how the vineyard can be an opportunity for agricultural diversification in areas where the economic model is heavily based on services, the tertiary sector and tourism;



- Bear in mind that forest management of Mediterranean forest plots is highly conditioned by the availability of subsidies or grants;

- Ensure that all proposed actions contribute to the future maintenance of livestock farms;
- Promote actions that favour the permanence in rural areas of a minimum population that can make a living from the primary sector.

Euro-Mediterranean actors



Italy, 17 October 2023

"The Aosta Valley is a very touristic region. In addition to wine production, viticulture is an important part of this tourism (wine-growing landscapes, etc.). It is vital to constantly communicate to politicians that it is important, even if it is costly, to develop and cultivate areas that may be abandoned, because in the end it is good for the whole of society. Agriculture and tourism must go hand in hand".

TC6. EXPLORE OPPORTUNITIES TO INCORPORATE CLIMATE CHANGE ADAPTATION ACTIONS INTO EXISTING PLANNING.

Common recommendation with technical staff and decision-makers in public administration

There is a need to give greater visibility to existing planning models in order to facilitate replicability (e.g. fire plans, Strategic Management Points, perimeter strips in housing estates, mature forests, etc.).

It is recommended that opportunities for climate change adaptation actions be identified in existing planning.

Representatives of the Working Community of the Pyrenees (CTP) and Euromontana

Final LIFE MIDMACC webinar on replicability and transferability,
26 April 2024



"The LIFE MIDMACC project will help us in the deployment of the measures of the Catalan Climate Change Adaptation Strategy for the agriculture, livestock and forestry sectors. We are also working to create a programme of resilient landscapes, where territorial communalities are created that interact with each other to mobilise private capital so that they do not depend exclusively on subsidies. And, therefore, these communalities are created where the sectors involved, landowners, livestock farmers, territorial actors, economic agents, can interact with each other". (Catalonia)

"The Government of Aragon plans to update the Aragonese Climate Change Strategy, so all the knowledge transfer that is being received from the various organisations in this MIDMACC project will be integrated into the revision of the Aragonese Climate Change Strategy. The Interdepartmental Council on Climate Change in Aragon will also be set up" (Aragon).

"On 8 February we passed the Energy Transition and Climate Change Law of the Basque Country, which is a very important milestone for us. The approval of this law in turn generates a series of obligations. Among them is the drawing up of a long-term energy transition and climate change roadmap, with a strategy for 2030. One of the priorities we have in this roadmap and in this strategy is the promotion of the primary sector. These projects, such as the results obtained from the LIFE MIDMACC project, will give us new ideas to include in the development of energy and climate sector planning in the Basque Country". (Euskadi)

6. Lessons learned and specific recommendations for technical staff and public administration officials

6.1 Preparation phase of the measures

P7. ENVISAGE THE POSSIBILITY OF INTRODUCING A QUALITY LABEL LINKED TO LANDSCAPE MANAGEMENT.



It is necessary to foresee the possible destinations and marketing channels for the grapes obtained from the vineyard trials (e.g. D.O.C., quality label, local wineries). It is recommended to accompany vineyard improvement actions with marketing strategies and quality labels, such as "mountain wine", useful for the replicability of climate change adaptation actions in vineyards.

It is also recommended to propose the creation of a quality mark for livestock products incorporating the added value of the ecosystem services it provides.



It is recommended that strategies be sought to increase economic profitability, mainly in the sale of meat, by increasing its price. Possible measures include the promotion of mobile slaughterhouses, the promotion of direct sales to consumers, the promotion of local products and tourism, and the creation of a quality brand associated with extensive livestock farming.

Representatives of the Working Community of the Pyrenees (CTP) and Euromontana

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26 April 2024



"On the question of the quality label, there is now a new European directive regulating the use of labels that make environmental claims. It may be difficult to create a label for good landscape management or adaptation to climate change in the mountains. On the other hand, there is also a desire to take more account of environmental sustainability in the specifications for geographical indications, for example. The European Commission has told us that it is quite open to open a debate on this issue". (Euromontana).

"The creation of a quality label and a label is a very good idea in principle, but perhaps it needs to be qualified. I think it is a very good idea to value the work done by livestock breeders or farmers, not so much so that this means a commercial profit, but so that it is taken into account, especially by public administrations, when it comes to facilitating access to more hectares of communal land for these breeders, for example". (Navarre).

6.2 Implementation phase of the measures

11. FORMALISE AN AGREEMENT BETWEEN THE ACTORS INVOLVED ON THE BASIS OF THE DEFINED IMPLEMENTATION PLAN.

13. ENSURE THE INVOLVEMENT OF THE TERRITORY'S MANAGERS AND THE PRODUCTIVE SECTOR TO FACILITATE THE CHANGE OF MANAGEMENT MODEL.

14. MAINTAINING PASTORALISM AS AN ESSENTIAL ACTIVITY FOR ADAPTING TO CLIMATE CHANGE

15 SUPPORTING THE IMPLEMENTATION OF NEW MANAGEMENT STRATEGIES, INCLUDING NEW KNOWLEDGE OR THE DEPLOYMENT OF NEW INFRASTRUCTURES

This recommendation is the result of several lessons learned from the project, in relation to the need for accompaniment by the public administration to promote climate change adaptation measures such as, for example:

- Accompany the change in livestock management towards more autonomous systems by providing financial resources for the purchase of e.g. fencing or georeferenced collars.



- Facilitate the application for aid for the recovery of terraces, which are key for the vineyard and the landscape. Improving the landscape can also attract tourism.



- Create incentives that lower the cost of implementing forestry measures to adapt to climate change when there is little benefit from the forestry products obtained, while the cost of the actions is high.

- In general terms, ensure that the administration supports the actors at the technical level with aid and compensation.

Euro-Mediterranean actors



Italy, 17 October 2023

"In the Aosta Valley, there are measures that are partly financed by the European Union, such as the construction of low walls and terraces, but they do not have a significant economic weight. However, viticulture is a sector that has developed a lot in the last ten years. So the policy is a bit behind in supporting this sector. That's why we really liked the LIFE MIDMACC dossier, which is consistent with our desire to reach out to the public, to highlight the importance of having the budget to manage vineyards in a modern way and to recover hectares that, in the Aosta Valley, were historically vineyards and have now become forests or pastures".

Forestry technician



CITA, la Garcipollera (Aragon)

"The extensive cattle sector is stable and I would say that the number of head has increased in recent years. But it is true that the sheep sector is in decline. There is a very broad problem to discuss here, because it is no longer a question of politics, it is a question of facilities. It is a question of consumption. We do not eat lamb. In the end, lamb or sheep farming is maintained thanks to consumption in third countries such as Lebanon or the United Arab Emirates, because consumption in Spain is very low. Perhaps for economic reasons. Obviously nobody wants to breed livestock that has no outlet locally or that has to be sold exclusively abroad. "

"Here, for a legislative reason, there are no cheese dairies. And those that do exist are all compulsorily sealed with stainless steel, where the milk often comes from France or Castile. I can give you some examples. There are two very typical cheese dairies here, in the Jacetania region - I'm not going to name names, but you can imagine - whose milk comes from France. Therefore, the base of this cheese is not original. In other words, we cannot sell Jacetania cheese if the raw material does not come from here and the sheep have not been grazing in our pastures".

Representatives of the Working Community of the Pyrenees (CTP) and Euromontana

Final LIFE MIDMACC webinar on replicability and transferability,
26 April 2024



"We are going to integrate the lessons learned from LIFE MIDMACC in our public decisions, especially in our project financing decisions, in order to develop our aid and support for forest management, viticulture and all that has to do with pastoralism. The conditions of our support for mid-mountain areas are specifically monitored by the "Parlement de la Montagne", which is a discussion forum bringing together elected representatives, economic actors and representatives of civil society to discuss the problems facing the mountains of Occitania, both on the Pyrenean side and on the Massif Central. (Région Occitanie)

6.3 Phase of communication and transfer of measures

CT1. TAKING ADVANTAGE OF THE FACT THAT ADAPTATION TO CLIMATE CHANGE IS A TOPICAL ISSUE

TC2. TRANSFERRING EXPERIENCES FROM THE ADMINISTRATIONS

TC6. LINKING ACTIONS TO THE PROMOTION OF OPPORTUNITIES IN THE PRIMARY SECTOR AND IN RURAL AREAS.

TC7. PROMOTE PAYMENT FOR ENVIRONMENTAL SERVICES AS AN INCENTIVE TO DEVELOP NEW PROJECTS AND EXPERIENCES.

Society often does not yet perceive the added value of vineyards in mid-mountain areas or the value of the ecosystem services provided by livestock farming.

In this sense, it is important to promote awareness throughout society of the ecosystem services or environmental services provided by this primary sector as opposed to other development models that, far from providing ecosystem services, generate environmental externalities (vineyards versus the automobile industry).

It is highly advisable to find mechanisms that integrate consideration of the environmental services provided by the extensive primary sector and to consider the possibility of financially rewarding the provision of these ecosystem services.

Finally, it is recommended to promote the creation of incentives to carry out projects and experiences of adaptation to climate change that are profitable for economic actors: payment for environmental/ecosystemic services, etc.

Euro-Mediterranean actors



Italy, 17 October 2023

"Terraces provide an ecosystem service not only in terms of erosion, but also in terms of rockfall risk. These services should be taken into account when obtaining new authorisations for vineyards in areas at risk of rockfall in the Aosta Valley.


We need to keep reminding ourselves of the services that agriculture can provide to society and that it is often more expensive to intervene after a disaster than to invest in risk prevention. There is a recent example of a fire in June 2023 that took 3 days to contain and in which the owners lost everything".


TC8. FACILITATING AND EASING THE BUREAUCRACY ASSOCIATED WITH ACTIVITIES IN MID-MOUNTAIN AND PRIORITY AREAS FOR ADAPTATION TO CLIMATE CHANGE.



At European level, the authorisation of new plantations in mountain and slope areas is already a priority, but at national level this priority has not yet been transposed. On the one hand, it is recommended that priority be given to medium mountain areas as new vineyard areas, and it is urged that the procedures for obtaining the necessary administrative authorisations be facilitated/expedited.

On the other hand, it is recommended to make the production area assigned to the Rioja Designation of Origin more flexible and to assess whether it is possible to extend it to the mid-mountain area.

<p>Livestock</p> 	<p>Comarca del Camero Viejo (La Rioja)</p>
<p><i>"My activity also involves a lot of administration and paperwork to manage. I have the resources to handle it, but it's not always the case....."</i></p>	

<p>Representatives of the Working Community of the Pyrenees (CTP) and Euromontana</p>	<p>Final LIFE MIDMACC webinar on replicability and transferability, 26 April 2024</p> 
<p><i>"Facilitating administrative management can of course be made easier, we should do it for everyone, but especially and more so for those who have participated in pasture regeneration, for example, in this way. How? By providing them with a management, a document management service. In Navarre we have public companies specialised in this, which could focus more on providing this support" (Navarre).</i></p>	

TC9. ELEVATE SUCCESSFUL LOCAL CLIMATE CHANGE ADAPTATION INITIATIVES TO EUROPEAN POLICIES SUCH AS PAC.

It is considered that fire prevention policies are needed that take into account that it is more economically viable to implement prevention measures than ecological restoration measures. At the same time, it is difficult to raise the conclusions or proposals of adaptation projects to the European level. In this sense, it is recommended that the results of successful experimental projects and practices on adaptation to climate change be appropriated in order to bring their conclusions to the CAP.

In order to improve public aid aimed at supplementing livestock farmers' incomes, it is recommended that all environmental, landscape and climate change-related benefits be included in the Common Agricultural Policy (CAP) aid, that a PES (Payment for Environmental Services) be applied and that aid be granted for possible damage caused by protected species. Furthermore, it is recommended to promote the modification of the CSP (Pasture Subsidy Coefficients) of the Common Agricultural Policy to include wooded pasture as an eligible area.

<p>Representatives of the Working Community of the Pyrenees (CTP) and Euromontana</p>	<p>Final LIFE MIDMACC webinar on replicability and transferability, 26 April 2024</p> 
<p><i>"There are very interesting ideas in this project, for example on the recognition of wooded grasslands for payments. Today there is a lack of recognition, especially of agro-pastoral practices in some countries. And it is true that these are practices that allow adaptation in the countries most affected by climate change. These are recommendations from the project that we will be happy to incorporate into our messages for the CAP post-2027."</i> (Euromontana)</p> <p><i>"Many of the public policies that we apply and develop are set by European Union Directives or Regulations. In this sense, I would like to say that the Adaptation Mission that the European Union has launched at this time is a good focus prior to the modification of the CAP to emphasise the need to adapt these medium-sized mountain massifs that exist in Europe, which are abundant"</i> (Catalonia).</p>	

7. Lessons learned and recommendations for productive actors

7.1 Preparation phase of the measures

P2. DIAGNOSE THE PRIOR SUITABILITY OF EXPERIMENTAL SITES: PHYSICAL, ECOLOGICAL, SOCIO-ECONOMIC ASPECTS AND PRIOR DATA AVAILABILITY.

P5. CONSIDER LAND OWNERSHIP NEEDS AND CONTINGENCIES IN THE PREPARATION OF BUDGETS.

P8. SEEK THE SUPPORT OF THE ADMINISTRATIONS TO RECEIVE AID FOR THE IMPLEMENTATION OF INNOVATIVE AND EXPERIMENTAL ACTIONS THAT ALLOW PROGRESS IN THE MAINTENANCE OF THE FARM AND BETTER ADAPTATION TO CLIMATE CHANGE.

In mountain and mid-mountain areas, the costs associated with this type of action increase due to the manual performance of many tasks, the difficulties of access to the plots or even interactions with wildlife and possible damage to crops and equipment.

It is recommended to approach the relevant public administrations to seek synergies with recurrent programmes or possible subsidies that could mitigate the possible cost overruns inherent to mountain and mid-mountain work.



As innovative actions to improve livestock management, it is advised to use perimeter fencing to ensure the presence of livestock in cleared areas, to encourage the use of GPS to monitor livestock movements and to upgrade water troughs and salt points in order to facilitate farmers' tasks and improve livestock management.

Euro-Mediterranean actors




Portugal, 23 November 2023

"It is important that the search for support from public administrations is carried out at the local level, given that they are familiar with the idiosyncrasies of the place where the measures or experiments are to be implemented. It is key to secure the support of the local administrations where the experiments are to be implemented".



Note that the presence of wooded pastures in Mediterranean climates is key to animal welfare during the warmer months, as they provide shaded areas where animals can shelter.

<p>Livestock</p> 	<p>Comarca del Camero Viejo (La Rioja)</p>
<p><i>"Project managers should increase their efforts to communicate the results of the project to public administrations, so that they take the conclusions into account when managing and allocating pastures. In particular, it should be considered that, in this study area, the higher the stocking rate, the more pasture is generated and of higher quality (in the experimental plot only male sheep have been introduced, although the producer also works with horses and cows)".</i></p>	

7.2 Implementation phase of the measures

11. FORMALISE AN AGREEMENT BETWEEN THE ACTORS INVOLVED ON THE BASIS OF THE DEFINED IMPLEMENTATION PLAN.

12. ASSESS RISKS AND PROVIDE FOR COMPATIBILISATION MEASURES TO AVOID THEM, INCLUDING COMPENSATION TO PRODUCTION STAKEHOLDERS IF NECESSARY

13. ENSURE THE INVOLVEMENT OF THE TERRITORY'S MANAGERS AND THE PRODUCTIVE SECTOR TO FACILITATE THE CHANGE OF MANAGEMENT MODEL.

14. MAINTAINING PASTORALISM AS AN ESSENTIAL ACTIVITY FOR ADAPTING TO CLIMATE CHANGE

7.3 Communication phase and transfer of measures

TC6. LINKING ACTIONS TO THE PROMOTION OF OPPORTUNITIES IN THE PRIMARY SECTOR AND IN RURAL AREAS.

TRANSFER AND REPLICABILITY IN THE LIFE MIDMACC PROJECT

Since the beginning of the project, the OPCC has been developing activities aimed at promoting the transferability and replicability of the results of the LIFE MIDMACC project.

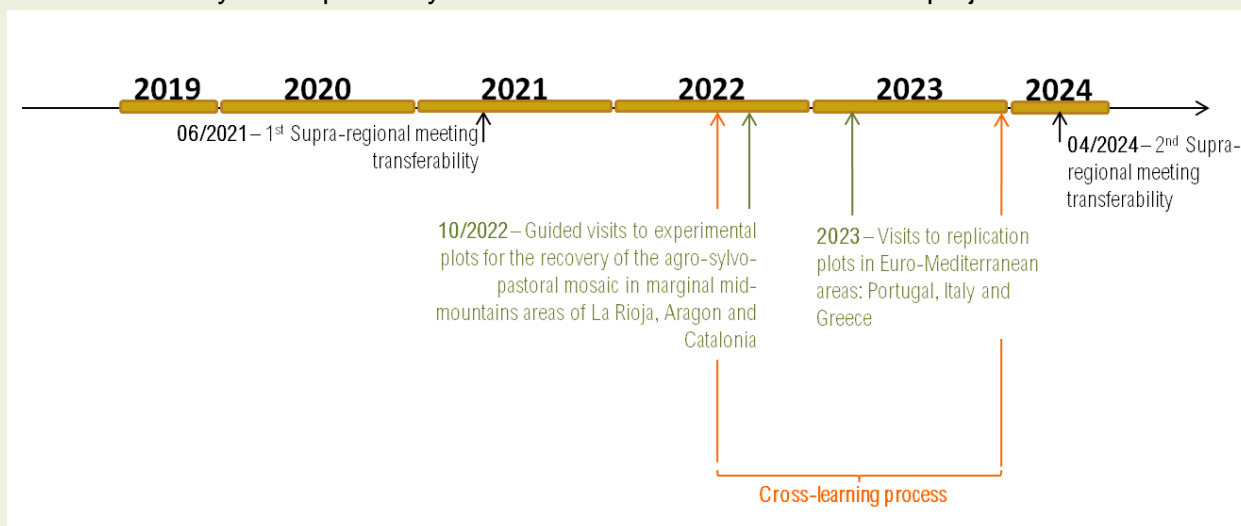


Figure 6 : Chronology of the transfer activities of the LIFE MIDMACC project

A specific programme has been established with each Euro-Mediterranean partner, with which a collaboration agreement has been signed to promote the transfer of project results:

- Centro di Ricerca, Studi, Salvaguardia, Coordinamento e Valorizzazione per la Viticoltura Montana (CERVIM) in Italy, for the restoration of mountain vineyards and the agro-silvo-pastoral mosaic.
- Associação Aguiar Floresta in Portugal, for forest management, extensive livestock farming with a regenerative perspective and agro-silvo-pastoral mosaic.
- University of Thessaly in Greece for forest management, pasture recovery and agro-silvo-pastoral mosaic.

The main activities have been the organisation of trips and visits to the pilot sites in October 2022 and 2023 as well as the organisation of workshops for their contribution to the elaboration of this Manual, in October and November 2023 and February 2024.

Figure 7: Programme of visits to Euro-Mediterranean partners in 2022 and 2023





Mid-mountain adaptation to
climate change

With the support of



LIFE18 CCA/ES/001099