Project for the Adaptation to Climate Change of Extensive Livestock Production Models in Europe

STRATEGIC ACTION PLAN

for the adaptation of extensive livestock farming to climate change in mediterranean europe

CREDITS

EDITION

ADPM – Associação de Defesa Do Património de Mértola

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The Life LiveAdapt project seeks solutions for climate change adaptation of extensive livestock farming systems in Southern Europe, to make them profitable and continue to provide social and environmental benefits that contribute to climate change mitigation.

This Strategic Action Plan has been built from a careful participation process in which people and entities belonging to different areas related to the livestock sector and from different Mediterranean European countries have been involved. The people listed below have participated in this document in its design, contributing with their ideas in workshops and discussions and/or in its revision. The order in which they appear is alphabetical, responding to the desire that has accompanied us in the development of this text, which is that each and every one of the contributions have the same importance and consideration:

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1. Background

Extensive livestock farming is one that takes advantage of the natural resources of the land, with a low use of external inputs and mainly through grazing. In general, it is characterized by the use of livestock species and breeds adapted to the land, the use of diverse pastures adjusting to their spatial and seasonal availability, and respect for the environment in which it is sustained.

However, today extensive livestock farming is not a formally characterized and recognized activity with a specific regulatory framework or with its own space as an agrarian discipline clearly differentiated from other production systems. In the design and drafting of this document, it has been considered fundamental to start from a clear and agreed definition, accepted by the sector itself and backed by the scientific community, of extensive livestock farming. It is worth mentioning as a reference the document "Definition and characterization of extensive livestock farming in Spain (I)" prepared for the General Subdirectorate of Livestock Products of the Ministry of Agriculture, Fisheries, Food and Environment (MAPAMA) by the Fundación Entretantos and the Platform for Extensive Livestock and Pastoralism. As detailed in this document, the definition of extensive livestock farming is not based on a single line of argument (such as, for example, measuring how long grazing takes place), but on a series of parameters that, combined, would allow quantifying the degree of extensive production of livestock, understanding extensive livestock management as a gradient and not as a dichotomous state (extensive/non-extensive).

The Centro de Competências do Pastoreio Extensivo (CCPE) in Portugal, has agreed on an adaptation of this definition to the Portuguese territory, defining extensive livestock farming as a livestock production system based on the use of permanent pastures and grazing agricultural co-products, with low use of external factors of production, which favors ecosystem services, combats desertification and creates economic conditions for the settlement of the population on the land.

In France, almost all ruminant farms are linked to their land: 90% of ruminant feed (fodder and concentrates) is produced on the farm where they are raised. In addition, 60% of ruminant feed is grass (adding to grazing the forage harvested "in situ", when the available amounts exceed the needs of the herd and then redistributed when the available grass does not cover the needs or when climatic conditions make grazing impossible); this figure rises to 80% for cattle and sheep. The notion of extensive livestock farming is close to the definition given by the EEA, and is not directly related to the type of resources used but rather to the number of animals per surface unit. For example, in areas favorable to pasture growth, there are so-called intensive systems (high stocking density) based exclusively on grazed or harvested and allocated pastures.

The definition proposed by the European Environment Agency is more inclusive: “Agricultural system often practiced on larger farms, characterized by low levels of inputs per unit area of land; in such situations, the stocking density, the number of livestock units per area, is low”. Currently, most extensive livestock farms in the countries of southern Europe are not exclusively extensive, but are located in the intermediate positions of an extensive production gradient, which is defined at one of its extremes by herds whose feeding depends exclusively on grazing, using local resources and, at the other extreme, by those that are close to industrial animal production systems dependent on inputs external to the territory in which they live. Between both models there is a great variety of mixed models, which we can call semi-extensive. Standing out among them are the herds that combine grazing with feeding from a trough, when grazing is not possible, and which are very common in mountain areas and cold climates, both in Spain and in the rest of Europe. Therefore, intensive open-air production in which the animals are outdoors, with a certain freedom of movement around a farm, but whose diet lacks a territorial basis and are fed mainly on animal feed and concentrates are not considered. Consequently, neither are they taken into consideration in this document.

In accordance with the above considerations, this Strategic Action Plan (SAP) refers to extensive livestock systems that meet the reference definition, and those semi-extensive models in which most of the food comes from grazing and sustainable use of the territorial base of exploitation. Also considered, with a view to the adaptation objectives of the plan, are the extensive phases of production systems that combine extensive and intensive phases (for example, fattening phases), although their integration into policies specifically aimed at extensive livestock farming is left out of the scope of application of this SAP.

In recent years, extensive livestock farming and grazing have been gaining a growing role in different areas, not only in technical areas related to agriculture and livestock, but more and more frequently in matters related to sustainability, conservation of natural heritage, the prevention and mitigation of climate change, rural development or planning and land management, among other factors. In addition, those farms linked to their lands are directly affected by climatic variations caused by global climate change. Adapting to these challenges is essential for their preservation.

This document has been generated within the framework of the Life LiveAdapt Project, which aims to find solutions for the adaptation to climate change of extensive models of livestock production in southern Europe.

This Action Plan is proposed as a European strategy for the adaptation to climate change of extensive livestock farming as a whole, assuming three fundamental challenges:

The establishment of technical bases for the implementation of specific strategies to improve the adaptation and resilience of extensive livestock farming in the face of climate change. The document is designed for its applicability at different territorial levels, as well as for its development and processing in European instances.
The identification of possible obstacles to the implementation of the above-mentioned technical measures and solutions to eliminate these obstacles.
The incorporation of extensive livestock farming, according to its specific qualities, as a differentiated part of the general climate change adaptation strategies that are being developed at different political levels (European, national and regional).

These challenges will be addressed taking into account the current socio-economic context and environmental needs.

The preparation of this SAP has been sustained at all times in a participatory process that has involved representatives of all interested parties (farmers, authorities, NGOs, experts, research institutes, consumers, etc.) in Spain, France and Portugal in order to detect the key issues, needs and limitations to be taken into account in the development and implementation of policies for the adaptation and preservation of extensive livestock farms.

In addition, the document has the support of a working group of more than 20 people from the three countries, all experts on the subject from both the academic field and from the livestock sector, who have collaborated in its design, review and validation.

2. Justification of the need for an action plan for the adaptation of extensive livestock farming to climate change

2.1 Climate change and its threats to the Mediterranean area

Climate change is, without a doubt, one of the greatest challenges facing humanity at the present time. The increase in atmospheric greenhouse gas (GHG) levels is causing widespread warming and human responsibility for this rise in temperature is now beyond doubt (IPCC, 2022).

The effects of climate change will be especially adverse for agricultural production in Southern Europe, where the expected projections for the Mediterranean Basin are worse than in other parts of the world, with an increase in water deficit (Large et al., 2020). The adverse effects of climate change are adding to the already existing problems of desertification, water scarcity and food production, introducing new threats to human health, ecosystems and the national economies of the countries of the Mediterranean area. Relevant social and economic impacts are also expected in this regard, both due to a loss of profitability and productive capacity of the primary sector and due to the forcing of migratory flows from the south to the north that these effects will entail.

There is greater uncertainty in terms of rainfall reduction, but a more uneven distribution is expected. Most studies suggest that, in the region as a whole, there will be more rainfall in winter and less in summer. Decreasing total annual precipitation is also a likely effect, but even areas that receive more rain could become globally drier than they are today, due to increased evaporation and changes in the seasonal distribution and intensity of rainfall. As a consequence, the frequency and duration of droughts could increase throughout the region. For most Mediterranean countries, there are national web platforms that allow for a fine-scale analysis of forecast climate scenarios; for example, in Spain the climate change scenario viewer of the ADAPTECCA portal (https://escenarios.adaptecca.es/), in France the Drias portal provides regionalized climate projections (http://www.drias-climat.fr/) and in Portugal the Climate Portal (http://portaldoclima.pt) is a web platform that can be used as a resource to explore, assess, synthesize, and learn about vulnerabilities.

Despite the uncertainties about climate variability and its related problems, the IPCC Sixth Report (https://www.ipcc.ch/report/ar6/wg2/), published in August 2021, does not leave much room for doubt: changes in the Earth's climate are already observed in all regions and in the climate system as a whole. Many of the observed changes in climate are unprecedented for thousands, if not hundreds of thousands of years, and some of the changes that are already occurring, such as continued sea level rise, may not be reversed for several centuries or millennia. The report provides new estimates of the likelihood of exceeding the 1.5°C level of global warming in the coming decades, concluding that unless greenhouse gas emissions are cut immediately, quickly and On a large scale, limiting warming to about 1.5°C or even 2°C will be an unattainable goal.

Another problem resulting from climate change is that as sea levels rise, more salt water will be introduced into coastal freshwater aquifers. Salinity will add to the chemical and biological contaminants and high concentrations of heavy metals already found in water supplies around the world, and their combined effect is expected to have negative consequences on the population, in all agricultural systems and associated ecosystems (IPCC, 2022).

Furthermore, rainfall intensity is considered a key determinant of the transport of pathogenic microorganisms, and the probability of bacteria proliferating in aquatic systems increases with water temperature. Therefore, to the reduction in the volumes of surface water, especially stagnant water, in hot seasons we must add the consequent increase in its temperature, which will lead to marked losses in microbiological quality, if not an absolute lack of potability, especially for animals. Climate change will also affect groundwater recharge rates, which will add to the changes in edaphic humidity due to variations in rainfall. Increased dependence on groundwater in the future, both for agriculture and urban water supply, could lead to problems associated with the sustainability of water resources in many countries. This will require the implementation of appropriate policies that address the problems of sustainability and allocation of water, which in the future may be considerable. The coming decades will see increasing demand and competition for water in Mediterranean areas (MedECC Network, 2019).

Another important issue highlighted in this IPCC Sixth Report is that human actions can still determine the future course of the climate. There is clear evidence that carbon dioxide (CO2) is the main driver of climate change, although other greenhouse gases and air pollutants also affect climate. Climate change challenges us as a society, as an economic model, as a civilization and requires an urgent response, whose main objective is to stop global warming, but at the same time requires responses to the already evident impacts of a warmer, more extreme and uncertain climate. In this

context, adaptation to climate change comprises a broad set of strategies aimed at avoiding or reducing the potential impacts of climate change, as well as promoting better preparation for recovery after damage.

As outlined in Figure 1, climate change is leading to an increase in atmospheric temperature, a change in the rainfall regime and consequently an increase in the intensity and frequency of extreme natural phenomena, including of a catastrophic nature, such as floods, hurricanes or severe periods of aridity, among others. These changes in the climatic regime will have particularly important consequences for livestock production linked to the land. Such consequences can be grouped into four groups of threats:

a) direct threats to animals;
b) threats to pasture and livestock feed;
c) socioeconomic and cultural threats;
d) threats to ecosystems and land.

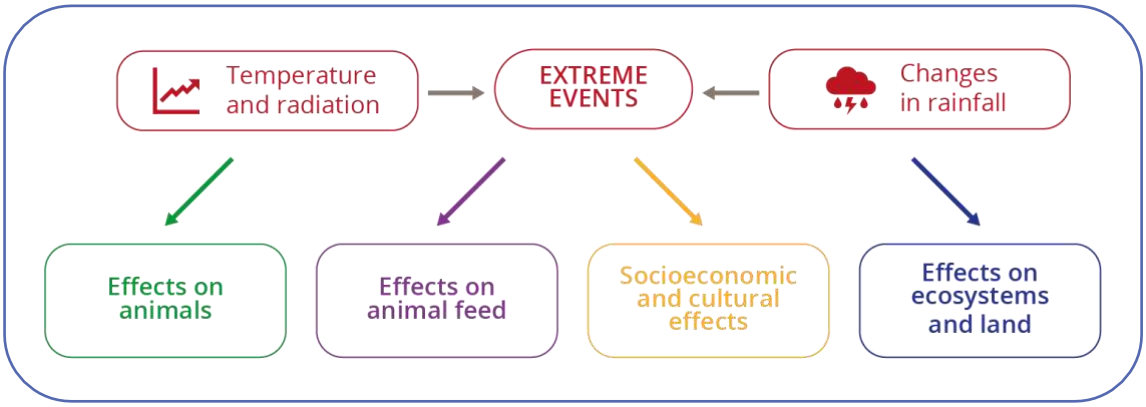


Figure 1 - Effects of climate change on livestock

2.2 Extensive livestock farming: real climate responsibility and opportunity for mitigation

Since climate change is such a serious environmental concern, in recent years much attention has been paid to the study and quantification of the climate impact of different productive activities. The carbon footprint has become a global indicator to assess and communicate the amount of greenhouse gases (GHG) emitted by the set of processes necessary for the production of the goods we consume.

Among the activities evaluated are those of an agricultural nature which represent, according to IPCC (2022), between 9 and 14% of GHG emissions worldwide. The world livestock sector has been evaluated to date in the context of global agricultural production and when a specific analysis has been made on the climate impact of livestock farming, it has been done in a somewhat confusing way, without distinguishing between livestock production models linked to the land and industrialized models. Therefore, carbon footprint studies applied to livestock activity (FAO, 2013) have in most cases ignored the possible positive interactions of livestock with ecosystems, studying the entire sector as a single production model that is disconnected from the territory, thus harming the productions that are integrated into the normal functioning of ecosystems.

This lack of differentiation is causing activities that are essentially different, both in their concept and in their execution and, of course, in their climatic and environmental effects, to be considered under the same framework. On the one hand, this leads to the fact that there is still a knowledge gap about the extent to which carbon sequestration, both in plant biomass and in soil organic matter, can offset emissions in extensive livestock systems. The need for more research on the capacity of ecosystems to store carbon is essential in the future to be able to take it into account properly. On the other hand, official estimates of GHG emissions linked to grazing are inadequate and, in general, overestimate its impact. For example, Zhu et al. (2020) have estimated that nitrous oxide emissions from excreta (urine and faeces) from extensive cattle in Kenyan savannas are up to 14 times lower than those estimated by IPCC indices. There are also numerous studies that have been showing that methane emission by ruminants decreases by up to 15-25% when browsing woody plants, rich in tannins, is included in the diet (Piñeiro-Vázquez, et al., 2015).

When attributing climate responsibility in a differentiated way to the different livestock models, it is also important to take into account that almost a third of the emissions attributed to livestock are derived from the use and change of use of land. This means that those livestock systems dependent on agricultural crops (soy or corn, for example) are likely to have collaborated in the loss of land for forest use. In contrast to this, the livestock systems linked to the land are responsible for the conservation of ecosystems, such as pastures and dehesas, with a very important role in mitigating climate change derived from the ability of these agrosystems to sequester atmospheric carbon in their soils and in plant biomass.

Soils store large amounts of organic carbon, storing more than twice that of the atmosphere and three times more than living biomass. For this reason, it is essential to take into account the relationship between livestock and its management with the agricultural systems that store it, since this will determine the balance of livestock activity as an emitter or as a mitigator of climate change. Pastoral systems, in any case, have great mitigation potential, mainly because herbaceous and woody grasses, woody pastures and grazed forests store large amounts of carbon in the soil, constituting one of the largest sinks for long-term carbon sequestration. On the contrary, degraded or cleared pastures, frequently due to the intensification of livestock activity, can have an equally notable opposite effect, emitting carbon into the atmosphere. The carbon storage potential of grasses is extensively covered in the IPCC report on soil. In short, the sustainable management of pastures (and, therefore, their use by extensive livestock farming) is an essential action to mitigate climate change. Nor should we lose sight of the fact that many wooded and forested territories also depend on livestock management to optimize their carbon storage capacity and prevent fires.

For all of the above, for extensive livestock systems it is essential that in the calculation of the carbon footprint not only should emissions derived from livestock be taken into account, but also the capacity of the ecosystems that support it to sequester atmospheric CO2, according to the management used. Some of the main models in use today, and which have a wide impact on political decision-making (such as the GLEAM model, the most widely used at the institutional level) do not adequately include in their balance the carbon sequestration in the soils used by exploitation, seriously disfavoring the image of extensive livestock farming compared to other models. The main consequence of this situation is that the entire livestock sector has been identified with the most industrialized livestock. This is one more reason why it is urgent to recognize the differential value of production models linked to the land, study them by understanding their specificities and apply political strategies in accordance with them.

It is worth noting the implementation of some adapted methodologies. In particular, the Cap2'ER® tool makes it possible to assess the environmental footprint of a farm and not just its greenhouse gas emissions. It is based on the principle of Life Cycle Analysis (LCA) from the inputs to the farm gate. This tool makes it possible to assess the emissions of each greenhouse gas, carbon storage, but also the impact on water quality due to nitrogen and phosphorus losses due to leaching or runoff, the impact on air quality due to nitrogen volatilization and finally the energy consumption. Other indicators reflect the positive contributions of livestock farming to biodiversity and carbon storage, as well as food performance (number of people fed per year) and sustainability criteria such as the working conditions of workers and economic performance. Built and developed within the framework of national and European projects, including three Life projects, this tool is currently used in France and is being deployed in 5 European countries, for all types of ruminant farms, within the framework of support initiatives aimed at accurately assessing the environmental footprint of a farm. The tool is updated periodically, according to the progress of scientific knowledge on the subject.

2.3 Extensive farming: a key activity for Europe's adaptation to climate change

Pastoralism is considered a key activity, recognized by prestigious international organizations, such as the FAO or UNEP, as essential for a green and circular economy, for the subsistence and well-being of millions of people and also as a tool to fight against climate change. climate. Already at the United Nations Conference on Environment and Development (Rio de Janeiro, 1992), the role played by extensive livestock farming in conserving diversity and managing the environment through traditional knowledge and practices was highlighted. In its favor, for example, is its historical capacity to adapt to social and environmental variables, as well as its resilience, its role in territorial management and governance, and its potential to mitigate climate change. The importance of pastoral activity in the maintenance of certain ecosystems of great natural value has also been demonstrated, and there is increasing evidence of how the abandonment of livestock activity leads to the deterioration or loss of habitats of notable interest and ecological singularity, as well as a decrease in the capacity of ecosystems to sequester atmospheric carbon.

Some of the key characteristics of grazing, in relation to its adaptation to climate change, are intrinsic to the production model. The most obvious characteristic for adaptation is the great variety of territorial resources that are used in a non-exclusive way, and that allow livestock feeding to be optimized by adjusting to the climatic characteristics of each moment and taking advantage of local food resources. Along these same lines, there is the possibility of using communal spaces and public land, or access to resources that are temporarily not used for cultivation or other activities. Although slightly more developed in the Mediterranean region than elsewhere, land use that does not belong to the farmer or for which he does not have a lease is still significant. This raises numerous legal issues related to land ownership and the allocation of CAP support. However, the use of farmed land is the main strength of polyculture-livestock systems, which can take advantage of post-harvest regrowth, graze cereals at an early stage, plant catch crops for fodder between two cash crops, and even redirect crops that were intended to be sold for animal feed.

Thus, extensive livestock farming can access a large set of natural resources, optimizing food, both in terms of quantity and quality, and the correct management of pastures. Here it is worth mentioning, apart from the pastures, the use of stubble, undergrowth, wild fruits such as acorns, shrub formations, cuts and pruning remains of palatable species, browsing, etc. In addition, extensive livestock farming makes it possible to take advantage of soils that are not very fertile and/or difficult to use for other purposes,

such as mountains, riverbanks or moors. Silvopastoralism, understood as the activity that integrates grazing and forest management when they coincide on the same land, constitutes a key discipline in adaptation to climate change, since it deals with the joint management of animals and forest space (and other spaces multifunctional, such as mosaics) optimizing the use of resources, animal welfare and protection, and the ecosystem services it provides, including carbon storage.

Another key characteristic of extensive livestock farming is mobility, understood as the ability to move cattle between points separated by several kilometers. It also allows managing the availability of food, moving the animals in search of optimal pasture conditions and guaranteeing the rest periods of the pastures. In addition, it allows taking advantage of diverse and remote resources, and also physically approaching the markets at the right times for marketing. Transhumance is an outstanding form of mobility, particularly relevant in Spain, still present in several areas of France and already residual in Portugal, and represents a long-distance mobility strategy, marking a maximum capacity for adaptation, since its routes take into account consideration the great climatic variety of the territories they cross. Mobile grazing is a way of life that has evolved in environments with a very high level of climatic uncertainty (deserts and arid zones, mountains, tundras, etc.), developing numerous strategies to ensure its survival and profitability, to adapt and to manage natural hazards. Livestock mobility is also a key tool in silvopastoral systems.

Indigenous breeds are also an essential element in adapting to climate change. Although at a first glance it may seem that the disappearance of many local breeds has been for the benefit of managing more productive breeds, it should not be overlooked that native breeds have been selected for centuries for their ability to use pastures and agricultural by-products, for their rusticity and specific adaptation to the land where they have been developed. For example, in territories where seasonal pastures are scarce, they can only be exploited profitably by perfectly adapted specimens. A high percentage of the non-urban surface of the Mediterranean areas of Europe is only directly usable by extensive livestock farming made up of rustic breeds. The native breeds are not only better adapted to the pastures of the area from which they come, they are also better adapted to the orographic conditions, diseases and the climate, assuming a much-needed genetic heritage for adaptation to changing scenarios. It will be necessary to incorporate in the future adaptation to temperature and hardiness in the face of aridity as characteristics of genetic selection within native breeds.

Finally, it should be pointed out that extensive livestock farming, due to its territorial link and its role in closing energy and territorial cycles, is a fundamental activity for Europe's progress towards a situation of greater food sovereignty and greater autonomy in the face of the instability of global markets and the influence of conflicts, shortages or extreme events. Faced with an imminent situation of oil scarcity and the necessary progress towards carbon-free economy strategies, international transport of supplies and food will tend to be reduced and more expensive. In this regard, extensive livestock farming, due to its link with the land and its autonomy from global markets in much of its food, will have better adaptability in future economic contexts, helping to maintain rural economies in disadvantaged areas, as well as their landscape and cultural values.

2.4 Why should extensive livestock farming be considered specifically in climate change adaptation strategies?

Despite the intrinsic characteristics of extensive livestock farming that give it a high adaptive potential, derived from an unfavorable starting situation linked to non-climatic factors, this activity is especially vulnerable and is having difficulties adapting to new climate scenarios.

The fragile profitability of farms is one of the keys to the problem, with costs that have increased a lot in relation to the income obtained from the sale of the product. An essential factor is the fact that sales prices are highly conditioned by the growing globalization of markets and by difficulties in distribution. The prices received by extensive farmers do not adjust to the reality of the sector, but rather to those set by the rules of the market in relation to all intensive productions. An additional problem in small and medium-sized livestock farms is the progressive disappearance of the resources and infrastructures that allow trade to be coupled to the territory, such as slaughterhouses, cutting rooms, cheese factories and butcher shops, thus making the farms more dependent on external agri-food chains. But in the case of extensive livestock farming, the added components of quality, sustainability, conservation of the natural environment, consolidation of the population in rural areas, etc. should be taken into account when establishing differentiated prices with respect to industrial production.

Socially, the sector is marked by a lack of empowerment and a lack of position in the value chain, despite society's growing understanding of the activity's environmental and social values. This makes it difficult to maintain small farms or achieve generational change.

It is essential to give extensive livestock an independent consideration, so that it is considered in its own context when designing the policies and regulations intended to support and control this activity. In addition, it is necessary to consolidate specific marketing channels for products derived from extensive livestock, proximity sales chains (which entail administrative and health regulation flexibility and simplification) and high-quality food circuits, in order to strengthen profitability of extensive production.

For all of the above, it is necessary to achieve a differentiated treatment as a sector by the public administrations of Spain and Portugal, as is already happening in France, and that the environmental services it provides be properly valued, providing differentiating labelling to extensive livestock products.

3. Objectives of the action plan

General Objective

Optimize, promote and support the adaptation of extensive livestock to climate change.

Specific Objectives

- Establish the technical bases for the implementation of specific strategies to improve the resilience and adaptation capacity of extensive livestock farming in the face of climate change.

- Specify and organize a series of lines of strategic action, built on partnership with the sector, updated and consistent at a scientific and technical level, whose objective is to support extensive livestock farming in Europe as a key activity in food security and sustainable land management.

- Offer, in a synthetic and user-friendly way, the scientific and technical arguments to identify extensive livestock farming as a key activity for mitigating climate change, as well as for the provision of other essential public environmental services for land management and adaptation. climate change in society in general.

- Promote the incorporation of extensive livestock farming, as a differentiated activity within the livestock sector in Mediterranean countries where this is not yet the case, in the strategies for climate change adaptation, which are being developed at European, national and regional policy levels.

4. Final recipients of the Strategic Action Plan

This document refers to the European context as a whole. However, due both to the greater participation of countries with a Mediterranean climate in the project, and to the particular vulnerability of these countries to climate change, this SAP aims to be particularly applicable to the Mediterranean context.

In a complementary way, this document has been designed to be applicable to different territorial, administrative and sectoral levels, offering a series of strategic lines and appropriate action proposals for the adaptation of extensive livestock farming to climate change, organized in a structured and systematic way.

Its updated content, solidly based and the result of careful multi-stakeholder participation, makes it a document adaptable to the needs of different administrative levels and potentially useful for sectoral organizations and the scientific community.

5. Scope of the document

The scope of this Strategic Action Plan is ambitious and global, defined from four dimensions: methodological scope, sectoral scope, technical-scientific scope and territorial scope.

▶ Methodological scope

It is a collective and consensual document, compiled by all the partner entities of the Life Live-Adapt project, whose scope and contents have been generated from participatory methodologies developed from the collaboration of multiple sectoral agents and reviewed and implemented by a large and highly qualified group of experts, who propose political strategies to improve the adaptation of extensive livestock farming to climate change.

▶ Sector scope

This action plan refers specifically to extensive livestock farming as defined above (Section 2), based on grazing and resources provided by the land, with a low level of external inputs and a high level of sustainability and integration in local ecosystem dynamics, as defined in Section 6. “Livestock systems included in the plan”. Throughout the document, the need to apply strategies adapted to extensive livestock farming is

argued and given relevance, due both to its specific qualities as an ally in mitigating climate change and in the adaptive capacity of the European food system in the face of the challenges that climate change will confront us with, and its recognition of the high vulnerability of this activity in the face of foreseen future scenarios derived from climate change.

▶ Technical-scientific scope

The information reflected in this document, as well as the conclusions and proposals expressed in it, are based on a solid and up-to-date scientific-technical basis. In addition, the design of its structure and its elaboration have been accompanied, supervised and reviewed by an interdisciplinary and qualified team of experts in the field.

▶ Territorial scope

The document is designed for its applicability at different territorial levels. However, its development stems from the extensive models of animal production in southern Europe. The participation in the elaboration of this document of partners from France, Spain and Portugal means that, although the proposed strategies focus on the adaptation of extensive livestock activity in Mediterranean climates, other bioclimatic zones of the indicated countries are also included in them.

6. Methodology

The methodology of this report is characterized by its attention to multisectoral participation and the search for a broad consensus on its contents, among producers and experts on the subject. The coordination of the document, in close collaboration with all the groups that make up the LiveAdapt Project, has been carried out by the technical team of the Fundación Entretantos.

The methodology used ensures that the SAP construction process is participatory, through a continuous exchange of information between the results of a technical nature and the results that originate in the participatory processes. To take care of the quality of this participation, all the sectors involved have been taken into account, as well as the different levels of responsibility and involvement in the subject with a multi-agent representation. The diagnosis of the problems to be addressed and the starting situation has been based on social analysis tools and has taken into account territorial diversity. Finally, it should be noted that the design and review of the document has been done collaboratively, basing the work on the constitution of a multidisciplinary group of experts in different fields related to extensive livestock farming and climate change, in addition to being constantly accompanied by the partner entities of the LiveAdapt Project and supported by the results of «Varenne agricole de l'eau et du changement climatique» from France.

The applied methodology has sought to identify, as clearly as possible, the different problems faced by extensive livestock in the face of climate change, linking it to emerging needs. Based on this diagnosis, work has been done on the declaration of recommendations, trying to deepen their specification so that they are useful, both for professionals in the sector and for those responsible for formulating policies.

7. Roadmap and structure of the action plan

The roadmap used to carry out this action plan is outlined in Figure 2. Work has been done to identify the different problems that challenge extensive livestock farming in the face of climate change, linking each of these problems to emerging needs and challenges for adequate adaptation. Starting from this previous diagnosis, work has also been done on the declaration of recommendations aiming to be detailed in their precision.

The aim of the plan is that the recommendations are precise and useful, in order to put them in perspective with the key regulations, policies and strategies in the European Union, identifying the most relevant political instruments in each case. Also, with the aim of improving the specificity and usefulness of each recommendation, they have been linked to the analysis of good practices and inspiring experiences at regional and national level in the Mediterranean context.

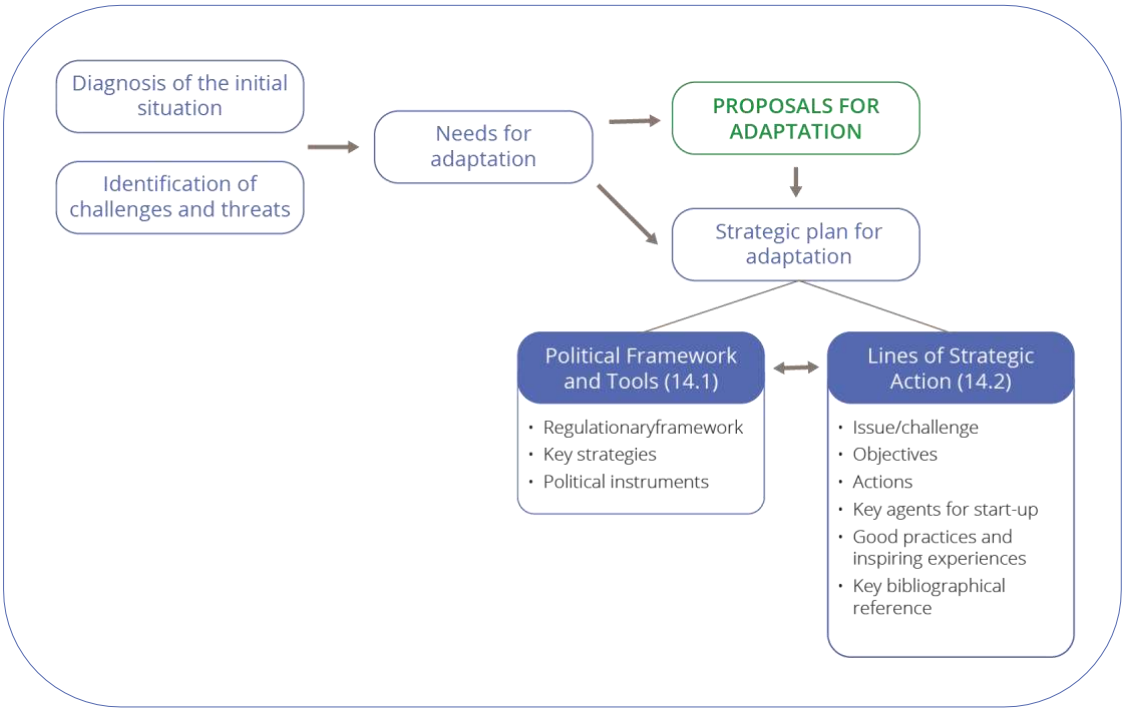


Figure 2 - Roadmap and structure of the strategic action plan

8. Instrumentation

Figure 3 shows schematically the structuring in actions and instruments of the participatory process for the collective design of the action plan.

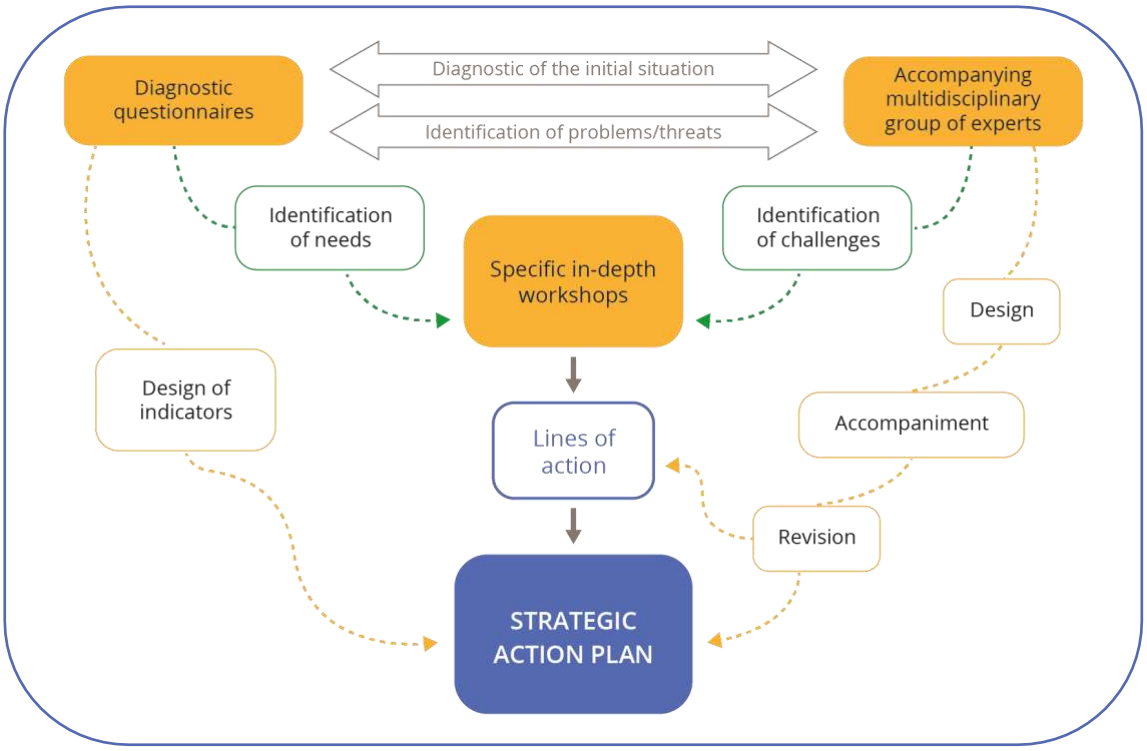


Figure 3 - Scheme of the actions involved in the participatory process for the elaboration of the Action Plan.

The methodological development of the Plan has been supported by the use of the following instruments, specially adapted to the needs of the Plan and organized by phases:

- Diagnostic questionnaires
  - Questionnaire on the perception of the effects of climate change on livestock production, aimed at the livestock sector. We received a total of 271 responses distributed among the 3 Mediterranean countries participating in the project: 131 from livestock farmers in Spain, 61 from France and 79 from Portugal.
  - Questionnaire on the problems surrounding access to water and its management aimed at the livestock sector. We received a total of 83 responses, with the participation of 62 people from Spain and 22 from Portugal.

- Online interviews with experts from the Extensive Grazing Competence Center (Portugal), academic institutions, producer associations, NGOs and companies in the sector, for the diagnosis of the situation of extensive livestock farming in Portugal.

Establishment of the Agenda for Research and Innovation

In the case of Portugal, through the process of diagnosing the situation of extensive livestock farming in the country, an Agenda for Research and Innovation in extensive livestock farming was established for the Extensive Grazing Competence Center, divided into 5 groups of work: definition of extensive livestock, production, training, marketing and promotion and climate change.

Multidisciplinary accompanying group of experts

The entire process of preparing this SAP, from its design to its consensus, has been accompanied by a multidisciplinary group of experts on the subject from Spain and Portugal. This group has been made up of 20 people from different professional fields related to the sector. The group has met in person and on-line and has maintained communication via email to monitor its development.

Specific in-depth participatory workshops

6 specific workshops have been carried out in Spain and France, to delve into those issues that were initially identified as more complex. In these workshops, a broad multisectoral participation has been ensured with the assistance of 79 people between the 4 sessions with representation of up to 39 entities involved in the sector, including unions, NGOs, livestock organizations and/or in defense of the sector, research groups, consumer groups, public administration at different territorial levels, etc.

The workshops were the following:

Theme	Place	Participants
Specific workshop on livestock mobility and animal health.	Córdoba	24
Specific workshop on water management for extensive livestock.	Plasencia	16
Specific workshop on fire and territory management.	Valladolid	20
Specific workshop on inter-administrative coordination to support the adaptation of livestock to climate change.	Madrid	19
Workshop on agrarian policies, agri-environmental measures and climate change.	Le Poiré-sur-Vie	11
Interviews with farmers about policies at European and regional level.	Sur de Francia	22

- On-line sessions:
  - Webinar on "Livestock and Climate Change" with presentations by 5 experts and the participation of 60 people (Spain).
  - On-line session for debate and search for consensus around the Strategic Plan for Adaptation of Livestock to Climate Change (Spain).
  - Webinar for the presentation and debate of the final draft of the document (Spain).

- Other tools for social analysis

In addition to collecting information through questionnaires, practical exercises have also been used, incorporated into the training courses carried out throughout the LiveAdapt Project, as well as through interviews with key agents in the sector.

- Literature review and web information

For the preparation of this document, intense work has been done to compile policies, already successfully applied or in the process of being applied, for each of the 3

representative countries of Southern Europe in which this strategy is framed. These compiled political experiences are completed with international background from FAO and WISP.

In addition, the updated scientific and technical literature published on the subject has been compiled and taken into account, as well as the results of related research projects.

▶ Own lines of research

From research projects of the entities participating in the Project and research framed within the Life LiveAdapat Project itself, among others:

- ✓ Singular AgroMIS Project: ceiA3 strategic instrument towards a Modern, Innovative and Sustainable Agro-Food production fabric: motor of the Andalusian rural territory (Spain).
- ✓ Prodehesa Montado Project: Cross-border cooperation project for the comprehensive recovery of the dehesa-montado 0276_prodehesa_ montado (Spain).
- ✓ Sectoral projects: Climalait, Climaviande, Adaptation of New Aquitaine goat systems to climate change, Cap'Adapt (France).
- ✓ Climate change adaptation work carried out within the framework of the Inosys Livestock Networks program (France).

▶ Translation of the document into 3 languages

To facilitate the use of the document and the achievement of its purposes, it has been published in Spanish, Portuguese and English.

9. Participated diagnosis of the initial situation

In this section we present the results of the questionnaires for the diagnosis from the livestock sector of the effects of climate change on their farms and the specific effects of water scarcity on farms. This diagnosis of the initial situation in terms of identifying needs and common problems of extensive livestock farming in the face of climate change, is developed in greater depth in the document "A1. Identification of common needs and problems produced for Climate Change in Extensive livestock farms" available on the project website.

▶ Climate change effects on livestock

The questionnaire for the diagnosis from the livestock sector of the effects of climate change on their farms has been disseminated on different dates and by various means and represents the participation of 271 livestock farms, distributed among the 3 countries of the Mediterranean area participating in the project: 131 livestock farmers from Spain, 61 from France and 79 from Portugal. The farms surveyed have an average age of 20 years in operation and manage different types of livestock, as shown in Figure 4.

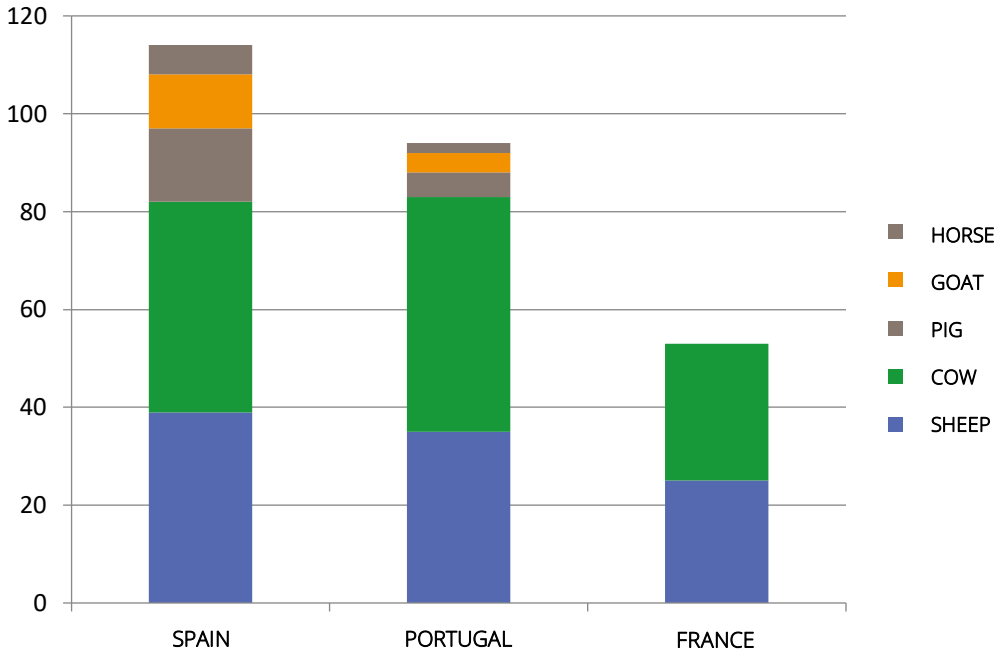


Figure 4 - Profile of responses by country and type of livestock

The assessment of the effects of climate change on farms in the different countries is reflected in Figure 5. It shows how the increase in maximum temperatures, water scarcity and climatic unpredictability are the effects that livestock farmers feel the most, being perceived as more intense on Portuguese farms. For all the effects evaluated, the intensity is lower in France compared to Spain and Portugal, except for the frequency of catastrophic phenomena, which is of greater concern in the Gallic country. On average, the people surveyed say they have observed the effects of climate change for 12 years, although several say they have been aware of its effects on farms for 30 years or even more.

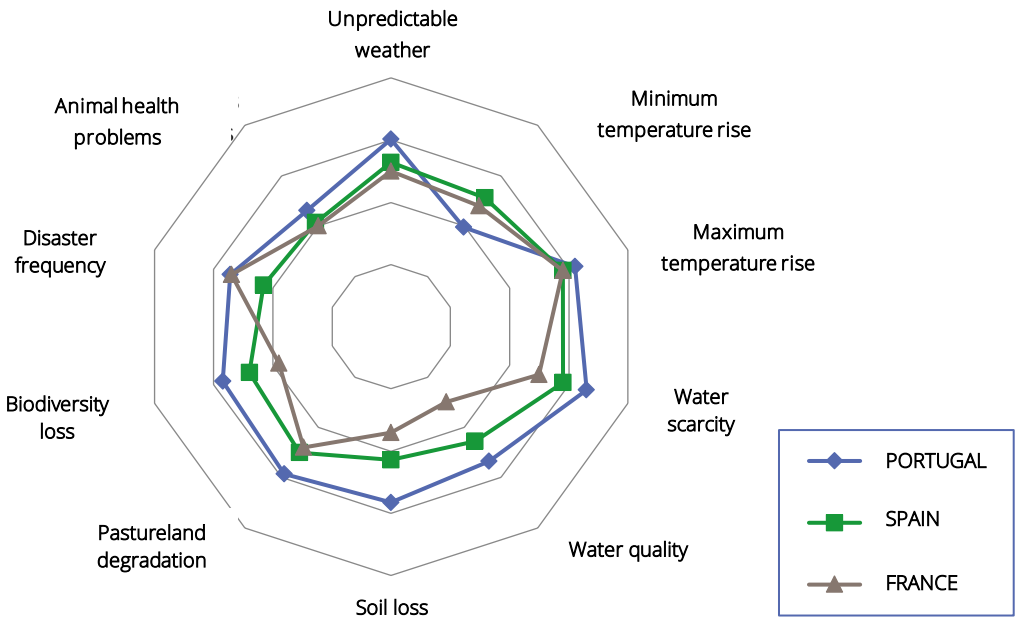


Figure 5 - Perception of the main effects of climate change on the farms surveyed .

In addition to the effects of climate change on the farms outlined in figure 5, the people surveyed expressed concern about other phenomena linked to global warming that are shown in Table 2.

Other impacts linked to climate change outlined
Most pronounced seasons
Changes in the distribution of rainfall throughout the year
Extension of the growing period of the grass
Greater abundance of Grass during winter
Less grass in summer
Less grass and fodder crops during the year
Increase in mortality of some tree species (e.g. increasi in drying oak)
Loss of agronomic references (seasons associated with tasks, phenological moments)
Reproductive problems in cattle
Increase in diseases and parasites in both animals and plants
Flowering and fruiting out of season
Increase in fuel biomass linked to increased fire risk
Decline in the crop fauna
Changes in fire behavior

Table 1 - Other impacts linked to climate change outlined

▶ Problems identified in relation to water in extensive livestock farming

Derived from the results of the first questionnaire, in which the relevance of access to water in livestock farms in the context of climate change is clear, a specific questionnaire was designed to diagnose the problem around water management. In this second questionnaire, also aimed exclusively at livestock farmers, 83 people participated (62 people from Spain and 22 from Portugal).

We identified that in the problems around water we can distinguish two large groups:
(1) access to sufficient water
(2) access to water of adequate quality

Regarding access to water, 79.6% of the people surveyed indicated their concern as serious or very serious. 43.3% have suffered the drying up of their normal sources of access to water and, given this, they have had to look for emergency solutions to be able to give the cattle enough to drink. On average, the people surveyed indicate that they have been suffering from these effects for about 8 years.

Regarding the quality of the water, 76.7% of the people surveyed indicated a serious or very serious concern. The 59% of the people surveyed have had potability problems in the usual sources of water for livestock in recent years; however, only 13.1% choose to make a water treatment to have drinkable water and 18% only make the treatment at moments of maximum need.

▶ Measures to deal with problems of access to water

Regarding the emergency measures adopted by livestock farmers in the face of scarcity or lack of water quality, the results are shown in Figure 7, which shows both the frequency with which the different emergency measures were adopted as the average cost of its adoption. It should be noted among the results that the measures that involve less cost, such as livestock mobility, the modification of water sources and the change in the order of use of pastures are not, however, the most frequently adopted measures. The people surveyed justify this contradiction as a result of two different problems: on the one hand, the bureaucratic obstacles with the administration and the regulations that regulate these measures and, on the other hand, the difficulty of accessing adequate pastures.

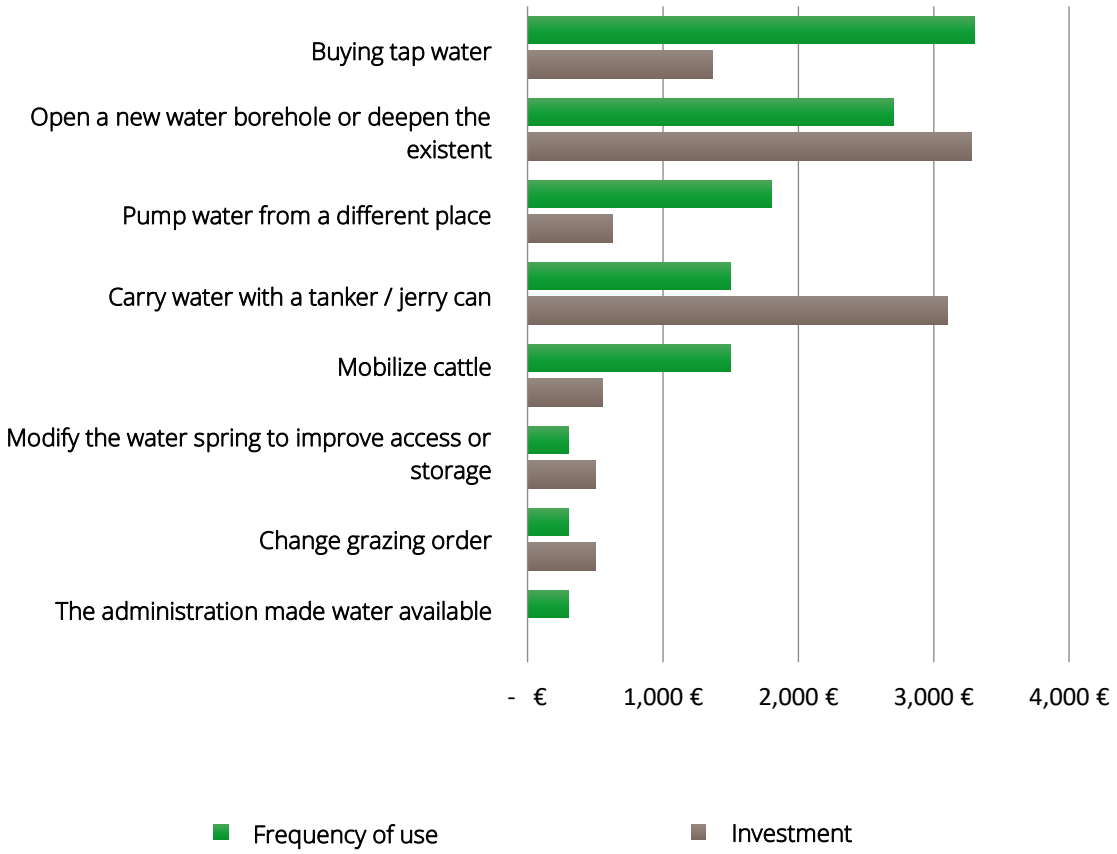


Figure 6 - Emergency measures adopted on farms in response to problems of access to water

The measures adopted on farms to improve access to drinking water and sufficient water in the long term (in the last 10 years) are reflected in Figure 8, which shows the frequency of implementation of the measure, together with the average investment required. and the normative/administrative difficulty that the people surveyed value having had for the implementation of the measure. In this case, the relationship between the necessary investment and the frequency of adoption of the measure is more consistent than when the measures are taken urgently, except in the case of the opening of new wells based on drilling that, despite the heavy investment they entail and the administrative difficulties for their adoption, are chosen for the greater guarantee of access to water that they entail, in the long term, compared to other possible measures.

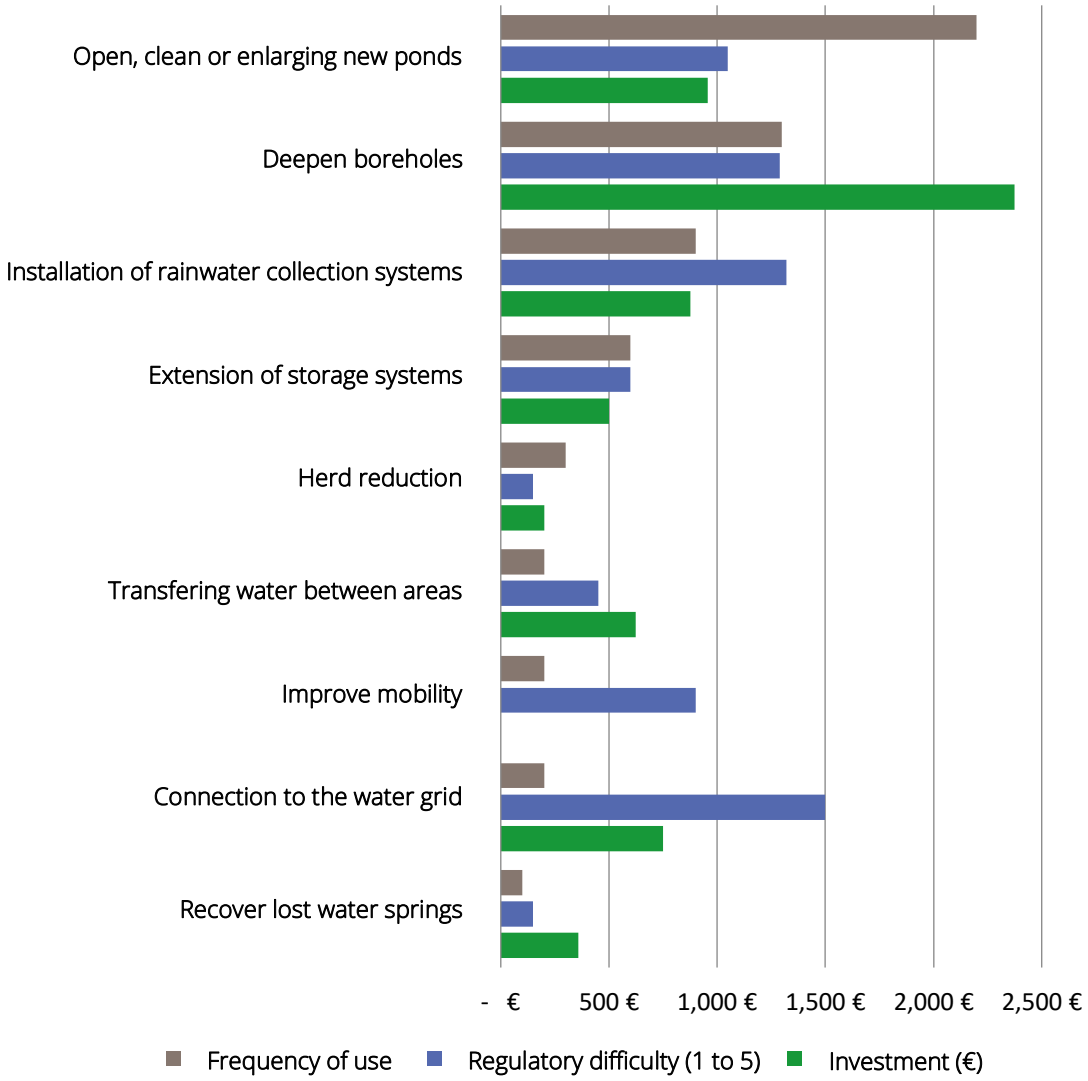


Figure 8 - Measures adopted on farms in the face of problems of access to water in the last 10 years .

10. Identification of challenges and threats

It is a fact that livestock systems linked to the land, based on grazing and mixed agricultural systems that are dependent on their environment, will be more affected by global warming than industrial livestock systems. On the one hand, the reduction in rainfall and the increase in temperature in Mediterranean areas will affect pastures and forage crops in the coming years. On the other hand, high temperatures and solar radiation will affect the health and welfare of animals, meaning that severe effects on farms can be expected.

In addition, it is also important not to lose sight of the fact that, in the context of the energy crisis and the desire to move towards carbon-free economies, international transport of feed and fodder, on which industrial livestock is highly dependent, will tend to be reduced and more expensive. And, in this regard, extensive livestock farming, due to its link with the territory and its greater autonomy with respect to global markets, will have better adaptability in future economic contexts. A key challenge will therefore be to strengthen and ensure this autonomy, at the scale of farms and/or land, or even exploit the complementarities between nearby territories (plains and mountains, for example).

The specific characteristics of extensive livestock farming therefore require differentiated, specific and relevant action to favor its adaptation to climate change, independently of how it is addressed in other more industrialized livestock systems based on global flows of materials and energy.

Table 3 lists the main threats to extensive livestock farming posed by climate change, in the context of the Mediterranean climate, according to the 4 groups of effects described in section 2.1.: a) direct threats to animals; b) threats to pasture and livestock feed; c) socioeconomic and cultural threats; d) threats to ecosystems and the land. These threats have been identified from the workshop held in Tudela (Spain, 2021) with the group of experts who have accompanied the creation of this action plan.

THREATS TO ANIMALS	Decreased health and fertility of livestock due to heat stress and decreased animal welfare.
	Increased animal mortality due to increased heat stress situations.
	Decrease in livestock production due to animal discomfort and dietary imbalances that reduce livestock intake.
	Change in the incidence patterns of parasites and diseases due to changes in the temperature and precipitation regime.
	Problems of access to water that is sufficiently abundant and of adequate quality.
	Health alterations caused by the low availability of food at certain times of the year.
THREATS TO LIVESTOCK FEED	Changes in the periods of pasture availability: reduction in the summer due to the hardening of the drought regime, but increase in the spring due to the increase in temperatures.
	Reduction in the availability and abundance of pastures due to the increase in the frequency and intensity of torrential rains and the intensity and frequency of periods of drought.
	Reduction in the carrying capacity of grasslands as a consequence of lower pasture productivity and potential change in their nutritional quality.
	Reduction of productivity and increase of productive irregularity of fodder and crops intended for animal feed. Increased cost of feed.
	Change in pest and disease patterns of palatable grasses and woody species due to changes in the temperature and precipitation regime.
	Potential appearance and/or expansion of non-palatable invasive species.

SOCIOECONOMIC AND CULTURAL THREATS	Increase in production costs in order to maintain adequate hydration, ventilation and temperature conditions for cattle on intensive farms.
	Potential increase in emotional stress and social conflict due to seasonal water scarcity and loss of food security.
	Abandonment of the rural environment with the subsequent loss of cultural and ethnographic heritage.
	Income irregularity in the sector.
	Increased cost of livestock insurance due to the increase in the number of livestock affected by heat stress and climatic catastrophes.
THREATS TO ECOSYSTEMS AND THE LAND	Reduction in the diversity of livestock species and/or breeds due to difficulties in adapting naturally to climate change.
	Increase in the incidence and magnitude of fires with an effect on the sector.
	Appearance of invasive species and changes in native vegetation derived from changes in environmental conditions.
	Threats to biodiversity including key fauna for pollination and maintenance of soil fertility.

Table 2 - Potential impacts of climate change on extensive livestock farming in the Mediterranean context (Results of the workshop held in Tudela, 2021).

11. Proposals for adaptation of the livestock sector

Table 4 shows, in a prioritized manner, the proposals from the sector to improve the adaptation of their farms to climate change. As can be seen in it, the measures related to the improvement in water management were by far the most mentioned.

Proposal suggested	No. of times
Improvements in water management. Increased storage.	23
Holistic grazing management. Fencing of farms and careful control of rotation times.	13
Replanting of pastures and increasing their diversity.	12
Increase in the value of extensive meat and awareness of its eco-social values.	10
Decrease in livestock loads.	10
Promotion of agroforestry management from the CAP. Planting of trees and shrubs.	10
Introduction of species and varieties more resistant to drought, heat and pests.	9
Strengthening of native/rustic breeds, contextualizing their qualities within the framework of future climate scenarios.	7
Soil regeneration and improvement.	7
Increase and promotion of livestock mobility.	6
Manuring and liming of pastures.	5
Ecological management of productions and reduction in the use of phytotoxics.	5
Coordinate grazing with fire prevention plans.	4
Control of grass scrub.	3
Diversification of livestock production and support for mixed economies.	3
Training for technical and livestock personnel for adaptation and extensivity.	3

Table 3 - Proposals from the sector to improve the adaptation of their farms to climate change

According to these results, the proposals related to the water cycle have been broken down and listed in a separate table (Table 5), in which the proposals from the sector are synthesized to facilitate the adaptation of extensive livestock farming to scarcity and deterioration of the quality of the water necessary to supply the cattle:

Proposals for adaptation to scarcity and deterioration of water quality
Implementation and recovery of systems for collecting rainwater (such as cisterns, fish tanks, collection on roofs and installations, etc.).
Implementation of systems that increase the infiltration and retention of water in the soil (for example, key lines, hedges and tree boundaries, vegetable bands, etc.).
Administratively facilitate interventions to improve the collection, storage and access to water.
Control the use of water in industrial livestock facilities.
Limit or prohibit irrigation in traditionally rainfed areas.
Reduce and control the use of phytosanitary products in agriculture that deteriorate water quality.
Control water pollution due to runoff and illegal dumping.
Control the drilling of illegal wells.
Control of water consumed by tourism in summer.
Measures adapted to the peculiarities of each region.

Table 4 - Proposals for adaptation to scarcity and deterioration of water quality.

12. Action plan for the adaptation of extensive livestock farming to climate change

12.1 Regulatory framework, key strategies and policy instruments

The objective of this Strategic Action Plan is to make the policy recommendations as concrete and useful as possible. To do this, in this section we identify the most relevant policies, strategies, and regulations that are currently determining the context of extensive livestock farming and its immediate future.

- **Harmonization with international commitments**
  This SAP is contextualized in the fulfilment of various international commitments assumed by the countries of southern Europe in the last decade:

  - The United Nations Framework Convention on Climate Change (UNFCCC) and its Paris Agreement: The essential objective in the work of this convention is to develop an international cooperative framework that allows all countries to face the risks posed by climate change and promote cooperation. The Paris Agreement (2015), which aims to limit global warming below 2oC, establishes among its basic objectives "Increase the capacity to adapt to the adverse effects of climate change and promote climate resilience and development with low emissions of greenhouse gases (...)". To this end, the Parties recognize the need for adaptation to be gender-responsive, participatory and transparent, to take into account the most vulnerable groups, communities and ecosystems, and to be based on the best available science (Art. 7.5).

    These issues have been considered in the guiding principles of the plan and its transversal aspects, which address, among other issues, the treatment of social and territorial vulnerability, the gender perspective to achieve a fairer and more inclusive society and the need to establish transparent information mechanisms related to impacts, vulnerability and adaptation of policies and measures.

  - Convention on Biological Diversity (CBD): This convention pays increasing attention to the interrelationships between biodiversity and climate change, which are expressed in a broad set of decisions approved by the Conferences of the Parties.

- United Nations Convention to Combat Desertification (UNCCD): As the only multilateral agreement on soil and land, it has the capacity to make a significant contribution to the fight against climate change from land management, rehabilitation and restoration of degraded land.
- The Sendai Framework for Disaster Risk Reduction (2015-2030): This agreement, adopted in 2015 at the III United Nations World Conference on Disaster Risk Reduction, commits the signatory parties to reduce disaster risk and build resilience. Climate change is explicitly recognized as one of the drivers of disaster risk.
- The 2030 Agenda for Sustainable Development: defined as "an action plan in favor of people, the planet and prosperity, which also intends to strengthen universal peace and access to justice". The agenda defines 17 Sustainable Development Goals. Six SDGs are closely related to climate change and the environment, and another five are affected by the impacts that global change is having on the most vulnerable areas of the planet.
- The international initiative "4 per 1000", launched by France in 2015 at COP 21, aims to demonstrate that agriculture, and in particular agricultural soils, can play a crucial role in food security and climate change. It consists of linking all voluntary actors from the public and private sectors to disseminate and implement concrete actions to sequester carbon in the soil.

▶ Strategy for Adaptation to Climate Change of the European Union

Within the framework of the European Policies for adaptation to climate change, this document is aligned with the Strategy for Adaptation to Climate Change of the European Union that was signed in 2013 and endorsed in 2021, as it is one of the key actions in the European Green Pact. The main objective of this strategy is to promote a more resilient Europe in the face of climate change, detailing the process until 2050, integrating adaptation into macro-budgetary policies. The long-term contribution of such a strategy is to achieve the temperature goals of the Paris Agreement, in line with the United Nations SDGs. The three basic objectives of that text are to encourage action by Member States, to facilitate better informed decision-making and to promote adaptation in key vulnerable sectors. This SAP responds to the 3 objectives of this strategy, promoting the action of the states of the European Mediterranean countries in terms of adaptation, offering a tool that facilitates decision-making to promote the adaptation of extensive livestock by identifying it as a key vulnerable sector for Europe.

EU Strategy on Biodiversity

The **EU Strategy on Biodiversity for 2030**, also presented in 2020, is based on the premise that protecting and restoring biodiversity and the proper functioning of ecosystems is essential to strengthen our resilience and prevent the appearance and spread of diseases in the future. In this text we have also considered the fundamental role of extensive livestock farming in achieving several of the objectives pursued by this strategy, as detailed in Table 5.

	Objective	Relation with extensive livestock farming
1	Stop the deterioration in the state of conservation of habitats and species. At least 30% of those not yet in a conservation status reach this category or show a positive trend.	A large number of habitats depend on proper grazing management for their conservation. In them, the abandonment of the practice of extensive livestock is having and will have very negative consequences.
2	Restore important areas of degraded and carbon-rich ecosystems	Extensive livestock farming plays a key role in maintaining many of the Mediterranean ecosystems and in recovering organic carbon from the soil.
3	Reverse the loss of pollinators	Pastures and meadows, whose maintenance is linked to their use by livestock, are essential to preserve the biodiversity of pollinating insects. Livestock contribute to seed dispersal by improving the genetic diversity of plants and their availability to pollinators.
4	Reduce the use and risk of synthetic pesticides by 50% by 2030.	Grazing is the most sustainable tool for maintaining green cover, borders, paths and ditches, avoiding the use of synthetic herbicides.
5	Achieve that at least 10% of the agricultural surface contains highly diverse landscape elements such as multifunctional margins, walls, terraces, ponds, etc.	Grazing is an indispensable instrument for the maintenance of landscape elements interspersed in agricultural spaces.

6	At least 25% of the European agricultural area must be under organic farming and increased adoption of agroforestry.	Animals are a key part of any organic farming and agroecology model, as they are key to nutrient cycling and maintaining soil fertility.
7	Plant 3 billion trees, fully respecting ecological principles.	The agrosilvopastoral systems of southern Europe have historically combined agricultural production with the presence of trees, contributing to the global enrichment of the territory and the sustainability of livestock production.
8	50% reduction in excess nutrients and 20% in fertilizer use.	Livestock is key to cycling nutrients and maintaining soil fertility, contributing significantly to reducing fertilizer consumption.
9	50% reduction in the number of Red List of Invasive Alien Species (IAS) of European Commission.	Livestock mobility is a proven fundamental tool for seed dispersal and maintenance of biodiversity in pastures and agrosystems. Extensive livestock systems help maintain the diversity of numerous habitats
10	No use of chemical pesticides in sensitive areas such as urban green areas in the EU.	Grazing is the most sustainable tool for maintaining urban green spaces without the use of herbicides and minimizing the use of machinery dependent on fossil fuels.

Tabl6 5 - Relationship between the objectives of the EU Biodiversity Strategy for 2030 and the protection of extensive livestock farming.

The European Green Deal and the Farm to Fork strategy

The European Green Pact or "Green Deal", published in December 2019, presents a roadmap for a sustainable EU economy and aims to make Europe the first climate-neutral continent by 2050. Within the key actions of the European Green Deal roadmap, there are two with a great influence on the agri-food sector, these are the "From Farm to Fork" Strategy and the EU Strategy on Biodiversity for 2030 indicating that the National Strategic Plans of the CAP must harmonize with the ambition of the Green Deal.

The "From Farm to Fork" Strategy was presented in 2020 and is part of the European Green Deal. With it, it is about harmonizing the food system with the needs of the planet and thus responding to the aspirations of European citizens to obtain healthy, balanced and respectful food with the climate and the environment. In this text we have considered the relevance of extensive livestock farming in achieving 3 of the 6 groups of measures to be adopted under this strategy:

- Measures to ensure food safety;
- Measures to promote sustainable food consumption and facilitate the shift to healthy and sustainable diets;
- Measures to guarantee sustainable food production.

Recovery Plan **NextGenerationEU**

The NextGenerationEU recovery plan represents a great opportunity for extensive farming. The first months of the pandemic and the widespread lockdown have been a great test for the food supply chain, highlighting the need to move towards more resilient food models in Europe. Through the recovery and resilience plans of the Member States, the Recovery and Resilience Mechanism aims to "mitigate the economic and social impact of the coronavirus pandemic and make European economies and societies more sustainable, resilient and better prepared for the challenges and opportunities of the green economy and digital transitions", with "672.5 billion euros in loans and grants available to support the reforms and investments made by the Member States". NextGenerationEU also includes €50.6 billion for REACT-EU, for "a green, digital and resilient recovery of the economy". These funds are already available, in 2021-2022, from the European Regional Development Fund (ERDF), the European Social Fund (ESF) and the European Fund for Aid to the Most Disadvantaged (EFAMD).

The new CAP and Rural Development Policies

The new CAP and the rural development policy, which will be implemented through the strategic plans and rural development programs of the member states, are also a key regulatory framework and a source of financing for the implementation of measures for the adaptation of livestock farming to climate change, particularly to support a fair income for farmers and to rebalance power in the food chain, but also to support generational renewal and rural areas.

The reform of the Common Agricultural Policy (CAP) for the period 2021-2027 (currently extended to 2023-2030) requires that the European Commission approve a Strategic Plan for each Member State with clear environmental objectives. A rigorous combination of monitoring and evaluation of measures and objectives adapted regionally through direct and clear environmental indicators should be the criteria that guide the approval of the Strategic Plan for a CAP 2023-2030 centered on the environment and oriented to the conservation of biodiversity.

For the success of national Strategic Plans that favor extensive livestock farming and its adaptation to climate change, the following would be relevant:

- Identify clear regional objectives territorially adapted to the needs and problems of the agricultural sector, as well as the necessary measures to achieve them;
- Define ambitious and complementary criteria for the three environmental instruments (extended conditionality, eco-schemes and agri-environmental and climate measures) of the Green Architecture of the CAP, especially in simple and complex landscapes;
- Ensure that other CAP instruments (less-favored areas, organic farming and protection of livestock breeds) really favor the sustainability and adaptation of extensive livestock farming;
- Invest in monitoring extensive livestock activity and its associated ecosystem services in order to assess whether the Plan achieves regional and national objectives and adaptively improve them if it does not.

Hygienic-sanitary regulations

E The so-called “food hygiene package”, which regulates food safety, has a significant influence on the marketing of products derived from extensive livestock farming. Composed of Regulation (EC) No. 852/2004 (related to the hygiene of all food products), Regulation (EC) 853/2004 (specific hygiene requirements for food of animal origin), and Regulation (EC) 854/2004 (repealed by the General Regulation of Official Controls (EU) 2017/625), aims to guarantee food safety from farm to table, in an integrated approach. In accordance with a principle of flexibility, food hygiene standards must be applied proportionally to the risk posed by certain operations, production methods or food establishments, through two levels of flexibility. Direct supply to final consumers, small quantities and private domestic use may be excluded from the scope of the Regulation, while exceptions may apply in specific circumstances to the technical requirements set out in Annex I and Annex II of the Regulation 854/2005 for the benefit of small businesses and family productions. The rules also allow the adoption of national measures that adapt the technical requirements in the case of small companies that use traditional methods or that belong to regions subject to special geographical limitations.

Directive (EU) 2019/633 on Unfair Commercial Practices

Based on the observation that within the agricultural and food supply chain, significant imbalances in bargaining power between suppliers and buyers of agricultural and food products are a common occurrence, and that such imbalances in bargaining power are likely to lead to unfair commercial practices when larger and more powerful trading partners seek to impose certain practices or contractual arrangements that benefit them in connection with a sales transaction, in the EU it was decided to introduce "a minimum standard of protection of the Union against unfair commercial practices", in order to “reduce the occurrence of such practices that are likely to have a negative impact on the standard of living of the farming community”.

In this way, Directive (EU) 2019/633, according to a "minimum harmonization approach", "allows Member States to adopt or maintain national standards that go beyond the listed unfair commercial practices". “Member States shall adopt and publish, no later than May 1, 2021, the laws, regulations and administrative provisions necessary to comply with this Directive. (...) They will apply these measures no later than November 1, 2021.” A first evaluation of the implementation of this Directive and the effectiveness of the measures established at the national level will be carried out before November 1, 2025.

▶ Other relevant policy instruments: RBPS and AKISS

Innovation in extensive livestock farming should not only be on the production side, but innovative political, social and economic support measures should also be adopted to facilitate adaptation and the global role of grazing in the face of climate change. We consider the establishment of result-based payment schemes (RBPS) to be fundamental tools for supporting extensive livestock farming, with the participation of the ranchers themselves. In results-based payments, payment is conditional on the achievement of a defined environmental result, and the farmer or farm manager is given flexibility to choose the most appropriate practices to achieve that result. At European level, various payment mechanisms have been applied based on agricultural results and the main financier has been the European Agricultural and Rural Development Fund (EARDF). The success of these mechanisms will depend on the choice of effective and relevant indicators of adaptation of the activity.

Another instrument of fundamental interest in the implementation of measures for the adaptation of extensive livestock farming are the Agricultural Knowledge and Innovation Systems (AKIS). In 2009, the European Commission highlighted the urgency of adapting these systems to face the speed of the challenges of the sector induced by the climate, achieving a sector capable of adapting to the demands of society and the challenges of the ecosystem. The AKIS have a fundamental role within the CAP 2021-2027, being included within the Transversal Objective of the CAP of the Strategic Plan of the CAP. This system tries to place farmers at the center and improve knowledge flows through a multi-stakeholder and interactive approach that promotes innovation and knowledge exchange for a more sustainable agriculture. The AKIS contemplate multiple public and private actors related to the agri-food sector: producers (including producer organizations and cooperatives), advisors (public centers, private entities such as professional agricultural organizations, private agricultural advisory companies), training centers, technology centers, universities, public administrations, supply and service companies, agri-food industries and retailers in the food value chain.

12.2 Strategic lines of action

This Strategic Action Plan proposes a series of measures for the adaptation of extensive livestock farming to climate change, these measures have been specified in 171 actions structured in 12 lines of strategic action.

Strategic lines of action	
I. Key lines	
I.A	Differentiation from extensive livestock farming
I.B	Fair and differentiated allocation of the climate responsibility of extensive livestock farming
I.C	Recognition and maximization of environmental services provided by extensive livestock farming
II. Political-economic support lines	
II.A	Highlight the value of the primary sector accompanied by economic, fiscal and financial support
II.B	Adaptation of the cap to the specific needs of extensive livestock farming
II.C	Improvement of inter-administrative coordination and territorial integration for the harmonization of standards
II.D	Training and awareness of professionals in the sector involved in the regulations that affect extensive livestock farming
II.E	Support for the differentiated commercialization and promotion of extensive livestock products
III. Lines aimed at improving management and handling	
III.A	Improving the adaptability of livestock farms
III.B	Improved water management according to adaptation needs
III.C	Recognition, facilitation and support for livestock mobility
IV. Lines of reinforcement of research and strengthening of the social fabric	
IV.A	Reinforcement of research, transfer and monitoring for the adaptation of extensive livestock farming to climate change
IV.B	**Measures to reinforce the social fabric and governance to adopt an inclusive adaptation strategy at the sector level**

Table 6 – Strategic lines of action

In order to make this document as manageable as possible, each of the 4 lines of strategic action and its 13 associated measures are organized in such a way that they can be consulted independently, offering in a schematic way what is the problem that it addresses, what objectives it pursues, what actions it groups together, what are the key agents that should be involved, inspiring experiences for some of the actions involved and one to three key bibliographical references that we have considered especially useful for the development of the measure. In this way, the common scheme in which the lines of action are organized is as follows:

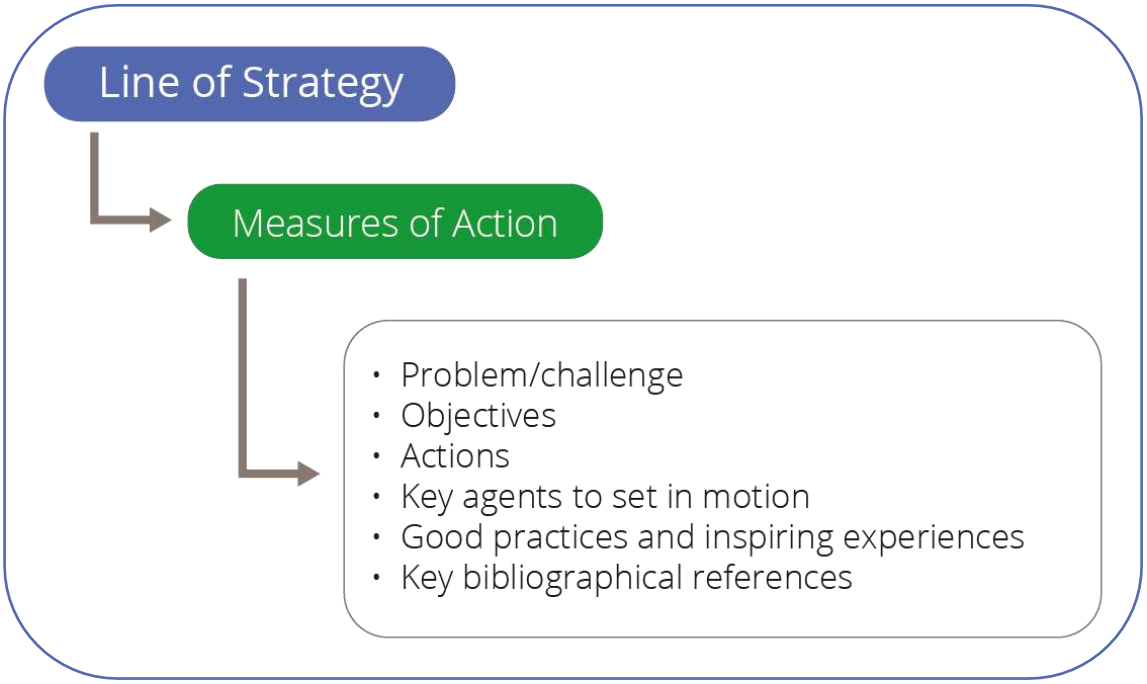


Figure 8 - Scheme of development of the lines of strategic action.

I. Key Lines

I.A. Differentiation of extensive livestock farming

▶ Problem / Challenge

Although the term "extensive livestock farming" is widely used and evokes a specific production model, its definition is not clear and there is no official characterization. This lack of differentiation makes it difficult to put into operation any type of initiative in which this type of livestock can be the protagonist.

The environmental impact of livestock, and especially its ability to mitigate and adapt to climate change, have gained importance in recent years. Extensive livestock farming plays a key role in these aspects, with profound differences with respect to the industrial version of it, which cannot be conveniently addressed without the establishment of a differentiating framework. Although, at different administrative levels, there is a willingness to support extensive livestock farming, particularly with regard to mitigation and adaptation to climate change, and also in other key environmental issues, such as the conservation of biodiversity, this will not be possible without previously advancing in the diagnosis and characterization of extensive livestock.
Another key issue is the incorporation within the new CAP of its own space for extensive livestock farming that allows these funds to represent real support for the activity.

Lastly, the lack of differentiation seriously hinders the monitoring of the activity and with it the ability of administrations to protect and promote it. As explained in detail in the document "Situation of extensive livestock farming in Spain I: Definition and characterization of extensive livestock exploration in Spain" published by Fundación Entretantos, the official databases currently in existence do not offer the minimum information that would be necessary for a first global approach to the measurement of extensivity. For example, key information to define the need for extensive production

in each territory is linked to the productive potential of the region, information that is very little developed today.

- Objectives
  - Advance towards a characterization of extensive livestock, firstly by trying to establish a clear and agreed definition and secondly by developing the concept of extensiveness.

  - Incorporate this definition in the various institutional spheres of an international nature (IPCC, FAO, WHO, OIE, etc.) and regulations (CAP, product certification, etc.) with which the activity is related in order to enhance the value of extensive livestock activity fairly compared to its industrial counterpart.

  - Generate a certification of extensive livestock that accompanies the activity and its derived products, in order to improve its economic viability and visibility.

Necessary actions for differentiation of extensive livestock farming	
I.A.1	Establish a clear and consensual definition of extensiveness, based on joint work with the extensive livestock sector, adapting said definition to the characteristics of each territory and type of animal managed.
I.A.2	Develop a differentiated political framework that includes its main characteristics and specificities as a basis for developing its adaptive potential and its capacity as a mitigation tool.
I.A.3	Legally recognize the specificities of extensive livestock farming, clearly differentiating it from other livestock modalities, adopting as starting criteria the territorial base, the low level of external inputs, grazing and the sustainability of the activity.
I.A.4	Recognize the specific characteristics of extensive livestock farming, such as the mobility of livestock, the management capacity of vegetation and habitats, and integration with agricultural flows, which favor its adaptation to climate change and its mitigation potential.
I.A.5	Establish the necessary mechanisms for the certification of the activity and its derived products.
I.A.6	Guarantee that this definition is incorporated into the different regulations that affect the activity, such as hygienic-sanitary regulations, animal health regulations, etc.
I.A.7	Guarantee that this definition is assumed by the different European institutions and that, therefore, they produce reports in which extensive and intensive livestock activity is differentiated when assigning climatic and environmental responsibilities.
I.A.8	Guarantee that this differentiation is reflected in the statistical content of an agricultural nature.
I.A.9	Guarantee that this differentiation is assumed by the organizations that represent the sector such as agrarian unions, associations and NGOs.
I.A.10	Move towards such a definition materializing in a certification of extensive livestock products that allow their differentiated treatment for consumption.

Agents with key competences for their launching		
Spain	France	Portugal
Ministerio de Agricultura, Pesca y Alimentación	Ministère de l'agriculture	Ministerio da Agricultura
Ministerio de Consumo	Ministère de la transition écologique	Ministério do Ambiente Ação Climática
Ministerio para la Transición Ecológica y el Reto Demográfico	Administrations régionales et locales	Gabinete de Planeamento, Políticas e Administração Geral
Administraciones autonómicas		
Key agents from civil society		
Agrarian unions/sectoral organizations/NGOs		
Agricultural cooperatives and economic agents of the sector		
Agricultural and rural development agencies/ Agrarian Chambers		
Research centers, universities and technical institutes		
Consumer associations		

References of good practices and inspiring experiences by country	
Spain	
Plataforma Por La Ganadería Extensiva Y El Pastoralismo	http://www.ganaderiaextensiva.org/
Ganaderas En Red	https://www.entretantos.org/proyectos-entretantos/ganaderas-en-red/
Fundación Entretantos	https://www.entretantos.org/
France	
Confédération Nationale de l´Elevage	https://devenir-eleveur.com/cne/
Institut national de l'origine et de la qualité	https://www.inao.gouv.fr/
Label Rouge (sellos de calidad)	https://www.labelrouge.fr/
Portugal	
Centro de competências do pastoreio extensivo	https://pastoreioextensivo.pt/
Centro de competências de caprinicultura	http://caprinicultura.pt/
Centro nacional de competências para as alterações climáticas do sector agroflorestal	http://www.cncalteracoesclimaticas.pt/

Bibliographical references

- Herrera et al., 2022. Avanzando hacia un sello diferenciador para la ganadería extensiva. Fundación Entretantos.

- Groshens et al., 2021. Le modèle d'élevage herbivore français, acteur du développement durable. IDELE.

I.B. Fair and differentiated allocation of climate responsibility of extensive livestock farming

▶ Problem / Challenge

U One of the important consequences of the lack of differentiation is being an unfair assignment of climate responsibility to extensive livestock activity. Emissions attributed to livestock are often used in the context of agricultural activity in general and the few specific studies analyzing the role of livestock do not make a differentiated attribution of climate impact between industrialized livestock production and extensive production. Thus, the models for quantifying emissions from livestock activity most used by institutions are, in general, ignoring the possible positive interactions of livestock with ecosystems, studying the entire sector as a single model of production unrelated to the land, thereby harming productions that are integrated into the normal functioning of ecosystems.

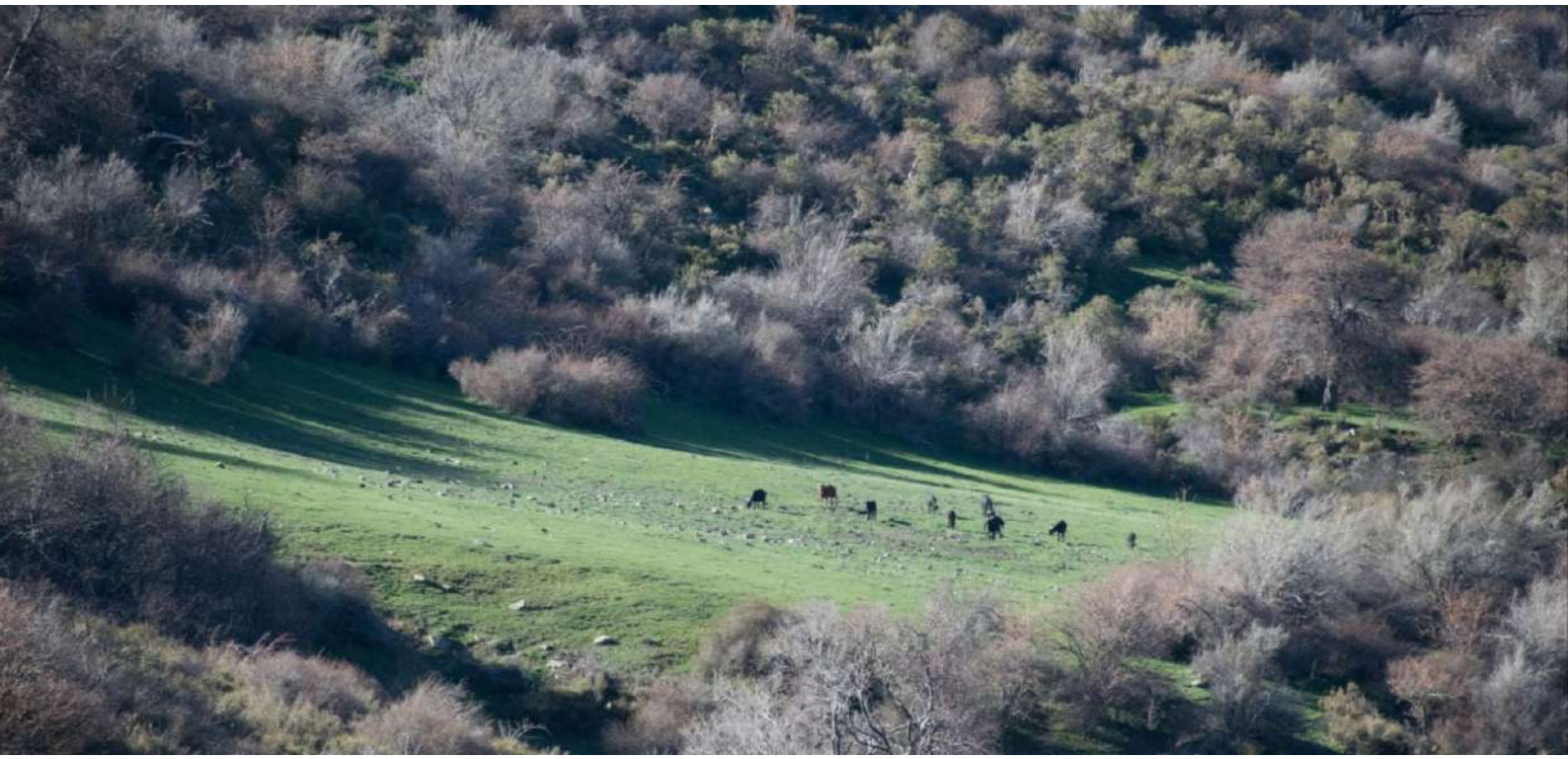
There are three essential characteristics of extensive livestock farming that are essential to take into account in the models used for the fair allocation of emissions from livestock activity according to the management used:

1) Ecosystems act as important sinks for atmospheric CO2 both in the form of plant biomass and in soils. The close relationship of extensive livestock farming with the conservation of these ecosystems and even with the promotion of their capacity as carbon sinks seems clear and must be taken into account in the emissions balances of livestock activity. Although in France there have been intensive studies on carbon storage in soils within the framework of the 4pour1000 initiative, this is not extensive to other European countries. It is necessary to collect and extend these studies with a harmonized methodology for the entire EU because, at present, and at a general level, there is poor quantification of the sequestration capacity of agrosystems and there are no databases with adequate information for incorporation into emission evaluation models.

2) Approximately one third of the emissions attributed to agricultural activity are related to the uses and changes in land use. Industrialized livestock farming is strongly dependent on crops frequently linked to deforestation processes (and, therefore, to changes in land use) and to forms of cultivation that emit carbon due to tillage and loss of organic matter from the soil. In contrast, the feeding of cattle in extensive management is linked to the use of territorial resources and the maintenance of land uses. This issue, clearly, should also be considered differently for the different production models, since the opposite supposes a grievance against land-based activities.

3) Another important proportion of the emissions linked to agricultural activity is linked to the transport of inputs, since the components of livestock feed often travel long distances from the point of origin to the destination. Once again, a territorialized livestock activity is much more autonomous in the use of food resources and less dependent on external inputs to the farms, so the emissions linked to transport are lower in extensive livestock compared to industrial meat production.

- Objectives
  - Attribute climate responsibility to extensive livestock farming in accordance with its intrinsic characteristics, that is, in its relationship with ecosystems that sequester carbon and, understanding its high degree of autonomy with respect to the consumption of global inputs.
  - Deepen the knowledge of the capacity of soils and pastures to sequester carbon and the link between this sequestration and livestock management.
  - Incorporate carbon sequestration in carbon footprint calculation tools that have not yet been incorporated, both in those used by international organizations and in private sector certifications.
  - Generate accessible and open national databases for calculating the content of organic matter in soils.
  - Improve international databases and tools for the study of soils such as SoilGrids or LUCAS (Land use and land cover survey).



Necessary actions for a fair and differentiated allocation of climate responsibility	
I.B.1	Strengthen scientific research in relation to the carbon sequestration capacity in soils and pastures or crops.
I.B.2	Strengthen scientific research in relation to the relationship of livestock and their different forms of management with the dynamics of greenhouse gas flows.
I.B.3	Generate and/or update models and tools for calculating the carbon footprint that incorporate knowledge about the specific characteristics of extensive livestock farming as differentiated from industrial meat and milk production.
I.B.4	Promote/monitor the use of tools for calculating the carbon footprint that assume a life cycle analysis (LCA) perspective, incorporating issues such as the impacts of the production and transport of livestock feed components.
I.B.5	Generate accessible and open national databases for calculating the content of organic matter in soils.
I.B.6	Improve international/European databases and tools for the study of soils such as SoilGrids or LUCAS (Land use and land cover survey).
I.B.7	Incorporate new knowledge about climate responsibility and the mitigating potential of extensive livestock farming in the reports and policies of European administrations and member countries, particularly in relation to Climate Change Strategies.

Agents with key competences for their launching		
Spain	France	Portugal
Ministerio de Transición Ecológica y el Reto Demográfico - OECC	Ministère de l'agriculture et de l'alimentation	Ministério da Agricultura e da Alimentação
Ministerio de Ciencia e Innovación	Ministère de la transition écologique	Ministério do Ambiente e Ação Climática
Ministerio de Economía y Competitividad	Ademe	Gabinete de Planeamento, Políticas e Administração Geral
Consejerías Autonómicas responsables de las Estrategias Autonómicas de Cambio Climático		
Agents involved from civil society		
Research centers, universities and technical institutes.		
Business sector linked to the primary sector.		
Entities involved in the use of tools and implementation of "carbon plans" (Chambers of Agriculture, dairies, etc.).		
Representatives of the sector (agricultural unions/sectoral organizations).		
Consumer associations.		

References of good practices and inspiring experiences by country	
Europe	
Land Cover and land use, landscape (LUCAS)	https://ec.europa.eu/eurostat/web/lucas
Spain	
BC3 Basque Centre for Climate Change	https://www.bc3research.org/
Red REMEDIA	https://redremedia.org/
Indehesa	
France	
Cap2ER	https://cap2er.fr/Cap2er/
Démarches de filière pour déployer les plans carbone. Ex. Ferme laitière bas carbone	https://www.ferme-laitiere-bas-carbone.fr/decouvrir-le-projet
Etude 4pour1000	https://www.inrae.fr/actualites/stocker-4-1-000-carbone-sols-potentiel-france
Projet Albedo Prairies	https://idele.fr/detail-article/albedo-prairie-etude-du-3eme-levier-de-lattenuation-du-rechauffement-climatique
Portugal	
Centro Nacional de Competências para as Alterações Climáticas do Sector Agroflorestal	http://www.cncalteracoesclimaticas.pt/

- Key bibliographical references
  - Alibés et al., 2020. Extensive farming and climate change, an in-depth approach. Fundación Entretantos.
  - Pellerin S. et al., 2020. Stocker du carbone dans les sols français, Quel potentiel au regard de l'objectif 4 pour 1000 et à quel coût ? Rapport scientifique de l'étude, INRA (France).

I.C. Recognition and maximization of environmental services provided by extensive livestock farming

▶ Problem / Challenge

Unlike intensive farming, extensive farming is a multifunctional activity. In other words, in addition to its productive function, it also provides other social and environmental functions, having great potential to provide "positive externalities" (eg, fire prevention) that are very important for society.

Among the multiple environmental services provided by extensive livestock farming, it is worth highlighting:

Conservation of biodiversity
Use of non-food agricultural resources.
Key in the maintenance of Ecosystems of High Natural Value (HNV).
Key in the recycling of nutrients and the maintenance of soil fertility.
Key in mitigating climate change by promoting ecosystem mechanisms for carbon sequestration.
Relevance in territorial autonomy regarding the import of mineral fertilizers.
Essential agent in seed dispersal.
They promote favorable environments for pollinator nesting.
Prevention of forest fires through vegetation control.
Practice of clearing and maintenance of infrastructures not dependent on fossil fuels.
Interaction with territorial hydrological and edaphic processes.
Key in maintaining cultural landscapes.
Valuable Traditional Ecological Knowledge of importance for adaptation to climate change.
Valuable cultural heritage. Particularly relevant in the case of transhumance.
Tourism and recreation.
Educational and training potential.

However, many of these public services are seriously threatened both by the intensification of livestock and agricultural production and by the abandonment of agricultural activity in general and pastoral activity in particular. The enhancement of these biophysical and socioeconomic services and their support through appropriate agricultural and environmental policies can restore the links between agriculture, livestock and the environment to the benefit of the sector itself and society as a whole.

- Objectives
  - Highlight, disseminate and offer training in the environmental values of extensive livestock farming.
  - Establish the necessary mechanisms for the allocation of fair payments for the environmental services provided by extensive livestock farming.
  - Establish the necessary mechanisms to relink agricultural and forestry activity, ecosystem conservation and livestock activity, understanding the synergistic benefits established between these elements.

Necessary actions for the recognition and maximization of environmental services provided by extensive livestock farming	
I.C.1	Promote the use of livestock in the maintenance of public infrastructure such as high voltage networks, road infrastructure or parks and gardens.
I.C.2	Recognize the value of extensive livestock and pastoralism in the generation of landscapes of ecological and cultural interest.
I.C.3	Establish mechanisms for the payment of environmental services provided by extensive livestock farming.
I.C.4	Assign a fair water footprint to extensive livestock farming and clearly differentiate it from industrial livestock farming associated with major impacts on water resources.
I.C.5	Recognize and claim the relevance of extensive livestock farming for the food sovereignty of Europe and its member countries.
I.C.6	Recognize the role of extensive livestock in maintaining and restoring the productive potential of agricultural soils and claim its relevance in a global context of mineral fertilizer crisis.
I.C.7	Guarantee forest management, environmental conservation and agricultural support regulations that incorporate knowledge about the environmental benefits of extensive livestock farming.
I.C.8	Value the cultural heritage of extensive livestock and pastoralism in the different territories.
I.C.9	Recognize the irreplaceable value of livestock in fire control by promoting the incorporation of this activity in fire management plans.
I.C.10	Strengthen scientific research in the knowledge of the environmental services provided by extensive livestock farming.

I.C.11	Promote the training and awareness of society in general and of professionals in the livestock sector regarding the environmental services provided by extensive livestock farming.
I.C.12	Promote the training and awareness of society in general and professionals in the livestock sector regarding the importance of extensive livestock farming in fire prevention.
I.C.13	Recognize the importance of fire in the management of land, advancing towards models of land management that are not suppressive in terms of its use.
I.C.14	Promote and facilitate the relationship between agricultural and livestock activity, understanding the synergistic benefits that are established between both activities.

Agents with key competences for their launching		
Spain	France	Portugal
Ministerio de Educación y Formación Profesional	Minsitère de l'agriculture	Ministério da Agricultura e da Alimentação
Ministerio de Agricultura, Pesca y Alimentación	Minsitere de la transition écologique	Ministério do Ambiente e Ação Climática
Ministerio para la Transición Ecológica y el Reto Demográfico	Administrations regionales et locales	Gabinete de Planeamento, Políticas e Administração Geral
Administraciones autonómicas		Direção Geral do Emprego e das Relações de Trabalho
Agents involved from civil society		
NGOs		
Professionals and associations of professionals in the sector		
Agrarian unions/sectoral organizations		
Research centers, universities, technical institutes		
Economic agents of the sector: cooperatives and agricultural companies		
Consumer associations		
Organizations for agricultural and rural development, chambers of agriculture		

References of good practices and inspiring experiences by country	
Spain	
Red de áreas pasto-cortafuegos de Andalucía (RAPCA)	https://www.juntadeandalucia.es/medioambiente/portal/landing-page-%C3%ADndice/-/asset_publisher/zX2ouZa4r1Rf/content/red-de-c3-a1reas-pasto-cortafuegos-de-andaluc-c3-ada-rapca-/20151
Ramats de foc	https://www.ramatsdefoc.org/es/
Mosaico Extremadura	https://www.mosaicoextremadura.es/es/el-proyecto/
Plan 42	https://medioambiente.jcyl.es/web/es/planificacion-indicadores-cartografia/plan.html
France	
Medidas DFCI (defensa de los bosques contra el fuego)	https://www.ecologie.gouv.fr/prevention-des-feux-foret
Portugal	
Life Landscape fire project	https://life.cimvdl.pt/
Life Lungs	https://life-lungs.lisboa.pt/

- Key bibliographical references

  - Gac, A., Bechu, T., 2002. L'empreinte eau consommative du lait et de la viande bovine et ovine : premiers repères sur des systèmes français. Institut de l'Elevage.

  - Herrera, P., et al., 2018. La ganadería extensiva, una actividad clave para nuestra alimentación. Fundación Entretantos.

  - Pau Costa Foundation, 2019. Guía docente de educación ambiental en torno a los incendios forestales. Manual dirigido a docentes y adultos para formar a los niños/as y jóvenes en prevención de incendios forestales y gestión del paisaje. Fundació d´Ecologia del Foc i Gestió d´Incendis Pau Costa Alcubierre.

II. Political-economic support lines

II.A Highlighting the primary sector accompanied by economic, fiscal and financial support

▶ Problem / Challenge

For Europe as a whole, predominantly rural regions represent more than half of the territory and around 20% of its population. However, most of Europe's rural areas are among the least favored regions, with a GDP per capita well below the European average. This factor, among others, makes the depopulation of rural areas a phenomenon difficult to reverse and requires an urgent approach.

Taking into account that the rural environment is the environment in which the activities of the primary sector are carried out and that, therefore, it is a necessary protagonist in the supply of food and raw materials for the whole of the European territory, the abandonment of the activity agriculture and the rural environment is a deeply worrying phenomenon and even more so in the current climate, energy and geopolitical crisis.

Despite the important economic [such as Forest Stewardship Council (FSC) and FEADER funds] and administrative endowments for rural development, these supports are often identified by the agricultural sector as indirectly harmful to the sector, since they often lead to more intensive and dependent practices of external inputs that end up breaking the profitability of farms.

It is essential to carry out an intensely participatory review of the primary sector and the rural inhabitants of such development policies so that they can really attend to their needs and in no case serve as erosive factors as is happening at present.

Objectives

- Value the relevance of the primary sector for the sustainability of the rural environment, the demographic challenge and food sovereignty.
- Promote balance and co-responsibility between rural and urban areas.
- Move towards a central positioning of the rural environment within public policies as a key strategy to promoting ecological transition and the activities of the primary sector.
- Promote entrepreneurship and eco-social sustainability in the primary sector.
- Carry out a participatory review of the regulations related to the primary sector and rural development to improve the role of the administrations in its defense, particularly with regard to the CAP and its specification in the Regional Plans of Rural Development, but also in relation to other European funds such as the Next Generation EU.

Necessary actions to increase the value of the primary sector accompanied by economic, fiscal and financial support	
II.A.1	Raise awareness among professionals in the sector, administrations and society as a whole about the value of the primary sector in food sovereignty, the demographic challenge, the supply of raw materials and the eco-social transition.
II.A.2	Raise awareness, train and address with shared plans the abandonment of rural areas and agricultural and livestock professions.
II.A.3	Facilitate access to land and communal infrastructure, particularly for young people and new farmers.
II.A.4	Value uses, customs and traditional knowledge as inspiring knowledge towards sustainability and economic autonomy.
II.A.5	Improve understanding and raise awareness of the relevance of the primary sector as a generator of landscape and territorial identity.
II.A.6	Implement measures to favor the settling of new settlers in rural areas, facilitating access to land, infrastructure and housing.
II.A.7	Favor the constitution of municipal banks for housing and productive land.
II.A.8	Integrate the importance and value of the primary sector into educational programs, showing agricultural professions as attractive, relevant, healthy and satisfying options.

II.A.9	Strengthen the bonds of mutual responsibility between urban and rural areas.
II.A.10	Promote the provision of necessary resources in rural areas to promote primary activity, food processing and short-chain marketing.
II.A.11	Implement participatory processes from the sector and the rural population for the co-management of funds aimed at rural development so that these really respond to the needs of the rural population.
II.A.12	Implement measures to reduce bureaucratization in the agricultural sector, particularly with regard to certifications, hygienic-sanitary regulations and short-channel marketing.
II.A.13	Implement measures to critically review the extent to which the digitization of bureaucratic processes is creating a new barrier for producers, as identified by the sector.
II.A.14	Establish measures for better coordination between the Demographic Challenge Service and other administrations.
II.A.15	Favor/force a clear commitment on the part of the regional administrations to establish agroecological criteria in the public purchase of breaths, both to guarantee that public money makes a clear commitment to regional agricultural production, and to the protection of regional economies as well as to the educational value of food to disseminate and raise awareness of the relevance of production models in shaping the territory, health, the local economy and food sovereignty.
II.A.16	Implement measures for the accompaniment of the new settlers in the livestock and agricultural activity.
II.A.17	Establish a favorable taxation of the activities of the primary sector and rural entrepreneurship.

Agents with key competences for their launching		
European Council: establishes strategic guidelines for rural development.		
Spain	France	Portugal
Consejo Económico y Social de España	Ministère de l'agriculture	Ministério da Economia
Ministerio para la Transición Ecológica y el Reto Demográfico	Ministère de la transition écologique	Ministério da Agricultura e Alimentação
Ministerio de Educación y Formación Profesional	Administrations régionales et locales	Ministério do trabalho, Solidariedade e Segurança Social
Ministerio de Hacienda y Función pública		Ministério da coesão territorial
Administraciones autonómicas y municipales		Ministério da Ciência, Tecnologia e Ensino Superior
		Ministério da Economia e do Mar
		Ministério da coesão territorial
		Gabinete de Planeamento, Políticas e Administração Geral
Agents involved from civil society		
Agrarian unions/sectoral organizations/NGOs		
Professionals and professional associations of the primary sector		
Consumer associations and in defense of the rural environment		
Rural Development Agents		
Economic agents of the sector: cooperatives and agricultural companies		

References of good practices and inspiring experiences by country	
Spain	
Red Terrae	https://www.tierrasagroecologicas.es/
Erasmus Rural	https://www.erasmusrural.com/index.php/jovenes-construyendo-una-europa-abierta-en-el-medio-rural/
Foro Acción Rural	http://www.redr.es/
Ganaderos por un día	http://nansanatural.es/ganaderos-por-un-dia/
France	
Medidas ICHN (subsidio compensatorio por minusvalías naturales)	https://daaf.guadeloupe.agriculture.gouv.fr/l-indemnite-compensatoire-de-handicap-naturel-ichn-a815.html
Acciones para revalorizar y promover la profesión agrícola	https://devenir-eleveur.com
Ayuda financiera y soporte de instalación.	https://www.sinstallerenagriculture.fr/contactez-votre-pai/
Portugal	
Programa trabalhar no interior	https://iefponline.iefp.pt/IEFP/interiorMais.do?action=overvieW

- Key bibliographical references
  - Order PCI/86/2019, of January 31, which publishes the Agreement of the Council of Ministers of December 7, 2018, which approves the Ecological Public Procurement Plan of the General State Administration, its agencies self-employed and the managing entities of Social Security (2018-2025).

II.B Adaptation of the CAP to the specific needs of extensive livestock farming

▶ Problem / Challenge

With an annual budget of more than 50,000 million euros, the Common Agricultural Policy (CAP) of the European Union (EU) deeply conditions the agri-food system of the member countries, as well as their ability to adapt to climate change. Unfortunately, in the various participatory workshops with the livestock sector that have been carried out for the drafting of this document, it has often been pointed out that a large part of the CAP funds are aimed at promoting the intensification of agricultural and livestock production, harming smaller farms with more environmentally and socially sustainable practices. Thus, after almost 50 years of aid from the CAP, the abandonment of family agricultural production continues to grow and, with it, the abandonment of rural areas and extensive livestock farming, showing a use of public funds that is not aligned with its objectives, which They are to guarantee the security and food sovereignty of the EU, maintain the capacity and productive activity in rural areas and the conservation of the environment.

The new reform of the Common Agricultural Policy (CAP) for the period 2023-2027 is aimed at achieving concrete results linked to the three pillars of sustainability (economic, environmental and social) that must be specified by the member countries in National and regional Strategic Plans for the CAP that set out the specific measures or interventions to be developed. Despite the fact that the framework of the new CAP at the level of the European Union does allow support for extensive livestock farming, the implementation of this aid is very uneven among the Mediterranean countries, leading to a livestock farm in Spain receiving a basic payment of 60 euros/hectare admissible of pasture while in Greece or Italy payments of more than 220 euros/hectare are received; it is also estimated that 70% of Spanish pastures are outside the CAP aid. In the case of Portugal, an example of the lack of support for extensive systems can be seen in the regulations for Organic Production: support for permanent pastures has been reduced by more than half in recent years and a premium has been introduced for grazing animals (per unit - UGM), thus stimulating the increase in livestock density, and with it, the intensification of livestock systems.

The green architecture of the CAP, according to the Strategic Plan Regulation, must contribute to mitigating climate change and adapting to its effects, promote sustainable development and the efficient management of natural resources such as water, soil and

air and also contribute to the protection of biodiversity, enhance ecosystem services and conserve habitats and landscapes. Extensive livestock is already generating this type of service today, so their work must be protected and compensated. In this regard, it would be necessary to opt for a reinforced conditionality that recognizes, accepts and assumes the key role of grazing in the management of vegetation, especially in stubble, fallow land and semi-natural elements of the landscape, and that drastically reduces the activities and treatments that prevent or make grazing difficult.

At the level of specific measures, a specific framework of measures for adaptation to climate change is proposed, focused on the water cycle, thermal regulation, the management of pastures and soils, as well as animal health.

- Objectives
  - Raise awareness of the responsibility of the CAP and its national implementation, in the agricultural model developed in the EU and the importance of that model being economically, socially and environmentally sustainable, stopping the abandonment of the primary sector and the rural world, reversing the change climate change and moving towards European food sovereignty.

  - Guarantee that the strategic plans of the CAP at the national and regional level are drawn up in a carefully participatory manner with the sector and assume the recognition of extensive livestock farming and its specific needs, aligning the provision of funds with such needs.

  - Opt for a reinforced conditionality that recognizes, accepts and assumes the key role of grazing in the management of vegetation, especially in stubble, fallow land and semi-natural elements of the landscape, and that drastically reduces the activities and treatments that prevent or hinder grazing.

  - Clarify at the regulatory level the differentiation of the concepts related to extensive livestock, clearly distinguishing between pastures or forest pastures of unproductive or abandoned land, thus avoiding the transfer of aid from extensive livestock activity to other activities not aligned with the conservation of the environment nor of a living rural world.

Necessary actions to adapt the CAP to the specific needs of extensive livestock farming	
II.B.1	Guarantee a process carefully chosen by the sector in the drafting and approval of the National Strategic Plans of the CAP.
II.B.2	Carry out a critical review of the texts of the National Strategic Plan of the CAP, guaranteeing that the budget distribution actually supports the sustainability objectives reflected in the National Strategic Plans of the CAP.
II.B.3	Move towards the bureaucratic simplification of CAP procedures, avoiding unassisted compulsory digitization and harmonizing procedures between regions and with other procedures necessary for livestock activity.
II.B.4	Move towards the harmonization of periods in which applications for the CAP are made with the periods of land lease.
II.B.5	Guarantee participation processes with the sector that facilitate the creation of a CAP at the service of the needs of each territory.
II.B.6	Unify the criteria for the admissibility of pastures among the different member countries and improve the national information systems that allow their monitoring.
II.B.7	Promote the use of more rustic and resistant breeds, stopping the current tendency to replace them.
II.B.8	Guarantee that at least all the pastures within the Natura 2000 Network are within the Direct Aid of the CAP.
II.B.9	Check that the Basic Income Payments (Direct Payments) are quantitatively similar for extensive livestock production than for agricultural production (currently in Spain they are 250% lower).
II.B.10	Review the Pasture Admissibility Coefficient, understanding that in extensive livestock farming in Mediterranean areas, the incorporation of trees into grazing areas is one of the fundamental tools in the adaptation of extensive livestock farming to climate change.
II.B.11	Adapt the CAP rules to the needs of livestock mobility by assigning unique farm codes per farm independent of the temporary unification of herds.
II.B.12	Make agricultural and livestock uses of the land compatible without losing support from the CAP, understanding that the integration of both activities, for example in the use of stubble, is essential for closing nutrient cycles and moving towards circular economies.
II.B.13	Work so that the Eco-scheme for extensive livestock, like other payment mechanisms for environmental services, has the participation of the sector in all phases of its design, evaluation and monitoring.

Agents with key competences for their launching		
Spain	France	Portugal
Ministerio de Agricultura, Pesca y Alimentación	Ministère de l'agriculture	Ministerio da Agricultura e Alimentação
Oficinas de la PAC	Ministère de la transition écologique	Gabinete de Planeamento, Políticas e Administração Geral
Administraciones autonómicas	Administrations régionales et locales	Ministério do Ambiente e Ação Climática
		Ministério da coesão territorial
		Comissões de Coordenação e Desenvolvimento Regional
Agents involved from civil society		
Agrarian unions/sectoral organizations		
NGOs		

References of good practices and inspiring experiences by country	
Spain	
Plataforma PorOtraPAC	https://porotrapac.org/recursos/
France	
Débat public imPACtons	https://impactons.debatpublic.fr/
Portugal	
Coligação PEPAC	https://www.speco.pt/pt/iniciativas/participacao-publica/coligacao-civica-pepac

- Key bibliographical references
  - Bartz, D., et al, 2019. El atlas de la PAC. Hechos y cifras sobre Política Agraria Común. Heinrich Böll Stiftung y SEO/BirdLife.
  - Détang-Dessendre, C., Guyomard H. (éd), 2020. Quelle politique agricole commune demain? Coll. Matière à débattre et à décider, Éditions Quae.
  - Guyomard, H., et al., 2020. Research for AGRI Committee – The Green Deal and the CAP: policy implications to adapt farming practices and to preserve the EU's natural resources. European Parliament, Policy Department for Structural and Cohesion Policies, Brussels.

II.C Improvement of inter-administrative coordination and territorial integration for the harmonization of standards

▶ Problem / Challenge

Agricultural and livestock policies are strongly linked to other sectoral policies such as water, consumption, rural development, land planning, forest management or nature conservation, which directly influence their implementation and the ability to achieve the objectives therein.

For this reason, the dialogue between the administrations that have competence over the different sectoral policies and over agricultural policies is essential to make coherent and synergistic interventions. At the same time, the involvement of society in general and the livestock sector in particular, in the decision-making process is essential for the implementation of policies consistent with the needs of extensive livestock farming. In addition, the understanding that territorial diversity is necessarily associated with diversity in intervention needs must be aligned with the implementation of territorially adapted policies through interconnected work between local and regional administrations and the population they serve.

For example, in Spain, in relation to the interactions between competent administrations, due to the current political model of the State of Autonomies and the distribution of competences that derives from it, most of the formal mechanisms of inter-administrative interaction are cooperation or collaboration, while coordination within the General State Administration, or between it and the Autonomous Communities is limited and occurs mainly through informal mechanisms.

In this regard it should be noted that frequently in the participatory work with the livestock sector that has given rise to this document, the administration, and its lack of coordination, have been pointed out as one of the key barriers to the sustainability of extensive livestock farming. so we point out the transformation of the administration into an ally and not into an obstacle for the development of the activity as one of the key lines in this strategy.

- Objectives
  - Transform the role of the administration into an ally of extensive livestock farming, identifying and overcoming the issues that currently make it a key barrier to activity.
  - Strengthen and improve inter-autonomous, inter-ministerial and intra-ministerial coordination mechanisms for the establishment of coherent and synergistic policies to support extensive livestock farming and its adaptation to climate change.
  - Value those policies, plans and experiences in which the administration has managed to be a fundamental ally in supporting extensive livestock farming and use them as pilot experiences for their replication.
  - Move forward in associationism and the creation of networks, so that the sector gains strength to influence public policies and its position in the market.

Actions necessary to improve inter-administrative coordination and territorial integration for the harmonization of standards	
II.C.1	Promote the national harmonization of the basic laws that affect the extensive livestock sector, such as, for example, in relation to health regulations and the custody of cattle trails.
II.C.2	Boost and encourage inter-autonomous and inter-ministerial coordination structures for the harmonization of support for extensive livestock farming.
II.C.3	Reward/encourage administrative staff willing to establish alliances and collaborations between administrations.
II.C.4	Approach the of Regional and Local Cooperation, as those responsible for coordinating regulations that affect several communities, so that they assume responsibility for voluntary newsletters between competent authorities, thus avoiding repetitive work between territories (Spanish context).
II.C.5	Establish the necessary mechanisms to encourage inter-departmental coordination within a ministry itself.
II.C.6	Establish participatory processes for the harmonization of forest, agricultural and environmental conservation regulations for the protection and promotion of extensive livestock farming.
II.C.7	Establish the necessary mechanisms for the incorporation of qualified technical personnel in interministerial coordination meetings that facilitate addressing each specific issue with sufficient perspective and depth.
II.C.8	Promote a review and subsequent simplification and streamlining of the bureaucratic processes that affect the livestock sector, also avoiding their mandatory digitization.
II.C.9	Support the structuring of the sector by promoting sectoral unionism, cooperation and associationism.
II.C.10	Promote plans and actions of governance and social participation at the territorial level, establishing bridges of obligatory transit between local and regional administrations and the interests of the sector, as a mechanism to avoid the homogenization of policies in heterogeneous environments.
II.C.11	Foster an interministerial consensus around the priority of land use for food production.
II.C.12	Establish control and maintenance measures for livestock trails and their associated infrastructure, sanctioning their usurpation.

II.C.13	Identify and disseminate successful experiences of support from the administration to extensive livestock, establishing the necessary measures to give them support that ensures their continuity over time and for their replication in other contexts and territories.

Agents with key competences for their launching		
Spain	France	Portugal
DG de Cooperación Autonómica y Local	Ministère de l'agriculture	Comissões de Coordenação e Desenvolvimento
Ministerio de Política Territorial y Función Pública	Ministère de la transition écologique	Ministério da coesão territorial
Ministerio para la Transición Ecológica y el Reto Demográfico	Administrations régionales et locales	Gabinete de Planeamento, Políticas e Administração Geral
Ministerio de Educación y Formación Profesional		Instituto do Emprego e da Formação Profissional, I. P
Ministerio de Consumo		Ministério da Ciência, Tecnologia e Ensino Superior
Administraciones autonómicas y municipales		Ministério da Agricultura e Alimentação
		Ministério da Administração Interna
Agents involved from civil society		
Agrarian unions/sectoral organizations/NGOs		
Professionals and economic agents of the primary sector		
Consumer associations and in defense of the rural environment		

References of good practices and inspiring experiences by country	
Spain	
BCN Smart Rural	https://www.desenvolupamentrural.cat/projectes/
Ayuntamiento del Boalo	https://www.elboalo-cerceda-mataelpino.org/tag/ganaderia/
Red CIMAS	https://www.redcimas.org/
Red de Ciudades por la Agroecología	https://www.ciudadesagroecologicas.eu/
France	
Fédération des communes pastorales	https://www.communespastorales.fr/
Portugal	
Comunidade intermunicipal de Terras de Trás-os-Montes	https://www.cim-ttm.pt/pages/482

- Key bibliographical references
  - Collaborarive authorship, 2009. Manual de Metodologías Participativas. CIMAS, Observatorio Internacional de Ciudadanía y Medio Ambiente Sostenible.

II.D Training and awareness of professionals in the sector involved in the regulations that affect extensive livestock farming

- Problem / Challenge

There is a lack of awareness about the importance of extensive livestock farming and a lack of knowledge of its specific problems on the part of the technical staff, and professionals in general, of the public administrations involved in the regulations that affect different aspects of the activity. At the same time, the lack of associative tradition in livestock is a problem for the sector to gain strength in the negotiation of these regulations and this is aggravated by the scant representation of extensive models in professional organizations and agrarian unions. Both factors mean that, frequently, the regulations faced by livestock farmers, such as health, forest management or nature conservation, hinder the proper development of their activity.

It is therefore necessary to train and sensitize the different professionals related to the sector on the specific needs of extensive livestock farming and its importance for the economic, social and environmental sustainability of the Mediterranean territories, so

that the application of regulations is adapted for the protection and promotion of extensive livestock. In addition, that the development of regulations is done in a participatory manner by the different agents involved is key to the coherence and harmonization of said regulations with each other and with the specific needs of the activity.

- Objectives
  - Make professionals related to the sector aware of the importance of extensive livestock farming, of the various environmental and social public services it provides and of the relevance of the cultural heritage linked to the activity.
  - Train professionals related to the sector in the specific characteristics and needs of extensive livestock farming.
  - Move towards the development and application of regulations that are more harmonized with each other, consistent with the needs of the activity and sufficiently flexible to address the need to adapt to climate change.
  - Move towards the consolidation of said regulations through the implementation of multi-agent participation and governance processes.

Actions necessary for training and awareness of professionals in the sector involved in the regulations that affect extensive livestock farming	
II.D.1	Implement training plans on participatory planning and co-governance aimed at administration professionals.
II.D.2	Raise awareness and train professionals in the sector about the importance of extensive livestock farming in the conservation of biodiversity, ecosystems and the landscape
II.D.3	Implement training plans aimed at Environment Agents, forestry personnel and animal health personnel on livestock mobility and other specific needs of extensive livestock farming.
II.D.4	Implement more flexible forestry plans, which include concepts of adaptation to climate change such as the need for regeneration of trees linked to the dehesa/montado and pastures, the management of new pests and diseases of the tree substrate derived from climate change or

	the incorporation of new forest species adapted to the new climate scenarios of the future.
II.D.5	Raise awareness and promote training plans on the synergistic relationship between agriculture and livestock in relation to the closure of ecological cycles, the intelligent management of soil fertility and progress towards circular economies.
II.D.6	Raise awareness and train the personnel involved in the ecological certification processes in the specific characteristics and difficulties of extensive livestock farming.
II.D.7	Support and promote the generation of the sector around extensive livestock (trade unions, cooperatives and associations) that enables its representation when establishing territorial policies and negotiating regulations that affect it.
II.D.8	Make technical personnel aware of the need to clear abandoned land for access to livestock, facilitating administrative processes for this purpose.
II.D.9	Train in the understanding of fire as a tool for managing the land, generating alliances between fire prevention services and farmers.
II.D.10	Train animal health personnel on the specific needs of extensive livestock farming and on the incorporation of protocols for the early detection of new diseases in animals derived from climate change.
II.D.11	Implement plans for research and inventory of traditional knowledge of the rural and agrarian world identified with great potential for adaptation to climate change.
II.D.12	Raise awareness about the import of traditional knowledge as sources of inspiration for energy and food sovereignty and the development of new technologies for adaptation (livestock mobility, botanical knowledge, biodegradable and territorially based materials, etc.).
II.D.13	Train and implement protection measures for transhumance, transterminance and grazing in general.
II.D.14	Raise awareness and offer training in the need for extensive livestock farming to coexist with wild species such as the wolf or the bear.

Agents with key competences for their launching		
Spain	France	Portugal
Ministerio de Agricultura, Pesca y Alimentación	Ministère de l'agriculture	Ministerio da Agricultura e Alimentação
Ministerio para la Transición Ecológica y el Reto Demográfico	Ministère de la transition écologique	Ministério da coesão territorial
Administraciones autonómicas	Administrations régionales et locales	Ministério do Ambiente e Ação Climática
		Ministério da Administração Interna
		Comissões de Coordenação e Desenvolvimento Regional
Agentes implicados desde la sociedad civil		
Agrarian unions/sectoral organizations/ NGOs		
Rural development agents		
Professionals and economic agents of the sector		
Research centers, universities and technical institutes		

References of good practices and inspiring experiences by country	
European	
Cursos para la adaptación de la ganadería extensiva del LiveAdapt	https://liveadapt.eu/
Spain	
Grupo Campo Grande (Iniciativa de mediación para la coexistencia del lobo ibérico y la ganadería extensiva)	http://www.grupocampogrande.org/
Escuelas de pastores	http://universidadesdelatierra.org/recurso/escola-de-pastors/ https://escueladepastores.es/
Revista Soberanía Alimentaria	https://www.soberaniaalimentaria.info/
France	
RMT Spicee	https://idele.fr/spicee/
UMT Pasto	https://idele.fr/umt_pasto/
Projet Transmission Past'orale	https://www.institut-agro-montpellier.fr/formations/
Réseau Coadapht	https://coadapht.fr/fr
Réseau chiens de protection	https://idele.fr/chiens-de-troupeau/
Portugal	
Escola de pastores	https://www.rebanhosmais.pt/escola-de-pastores/
Cursos para a adaptação da pecuária	https://liveadapt.eu/

- Key bibliographical references
  - Asín Semberoiz, A., 2015. Participación, gobernanza y políticas públicas. Cuadernos entretantos 2. Fundación Entretantos.

II.E Support for the differentiated commercialization and promotion of extensive livestock products

Problem / Challenge

Extensive livestock farming, despite being an activity increasingly recognized for the environmental and social services it provides and for the quality of the food products derived from it, is a sector that faces serious difficulties due to the low profitability of farms. Production costs have progressively increased, both due to the increase in the prices of external inputs and the increase in dependence on these inputs, and in parallel, the income obtained from the sale of products derived from livestock has stopped growing.

In this regard, the differentiation of the products derived from these livestock models from those derived from industrial productions is once again of vital importance. The profitability of extensive livestock systems would be clearly higher if a detailed computation was made of the benefits derived from this livestock activity and, even more so, if they were contrasted with the environmental and social impacts derived from livestock industrialization. The prices received by extensive livestock farmers do not adjust to the reality of the sector but rather to those set by the rules of the market in relation to all intensive productions. The low prices paid for extensive livestock products complicate the viability of farms and force a high dependence on public subsidies and this, therefore, must be reversed if the activity is to be protected. An improvement in the profitability of the products of extensive livestock farming and their enhancement will simultaneously facilitate the generational change, the pride of a well-paid job and the survival of life in the rural environment.

In the EU, significant amounts of money are invested in public food purchases, so the regulation of these purchases with public money so that they are aimed at supporting extensive production models could be relevant in protecting the activity.

Objectives

- Improve the social recognition of extensive livestock farming and achieve

certified differentiation of its derived products in the market.

- Consolidation of specific marketing channels for products derived from extensive livestock, proximity sales chains (which entail administrative and health flexibility and simplification) and high-quality food circuits.

- Promote and protect infrastructures for the transformation of livestock products as they represent an opportunity to increase their added value.

- Advance in associationism and the creation of networks, so that the sector acquires strength in its position in the market.

- Condition a public food purchase that promotes agroecological and territorialized production models.

Actions necessary to support the differentiated marketing and promotion of extensive livestock products	
II.E.1	Make society in general aware of the environmental and social values of extensive livestock farming and of the importance, therefore, of supporting it through the consumption of its products. Promotion and publicity.
II.E.2	Raise awareness in society about the best nutritional characteristics and organoleptic quality of food products derived from extensive livestock. Promotion and publicity.
II.E.3	Raise awareness of the links of responsibility and interdependence between the urban and rural areas.
II.E.4	Inform and sensitize the consumer on the seasonality of the products to facilitate the coupling between market demand and the availability of pastures.
II.E.5	Develop the necessary regulations for the differentiation of extensive production and associate it with its own certification. Differentiated labelling.
II.E.6	Simplify and make administrative and health regulations more flexible to facilitate proximity sales channels and food and health quality.
II.E.7	Protect, promote and improve municipal or cooperative infrastructures that allow the transformation of livestock products such as slaughterhouses, cutting rooms, wool washers or dairies.
II.E.8	Promote and facilitate the use of mobile slaughterhouses

II.E.9	Promote and facilitate the transformation and sale of livestock products on the farms themselves.
II.E.10	Promote and facilitate tourism experiences integrated with livestock activity.
II.E.11	Promote the integration of extensive livestock products within quality gastronomy, with an impact on the hospitality and tourism sectors.
II.E.12	Generate spaces for reflection, dialogue and cooperation.
II.E.13	Support the structuring of the sector by promoting sectoral unionism, cooperativism and partnership.
II.E.14	Condition a public food purchase that promotes support for extensive livestock farming.
II.E.15	Evaluate and move towards a tax system that rewards the environmental services provided by sustainable agricultural products.

Agents with key competences for their launching		
Spain	France	Portugal
Ministerio de Consumo	Ministère de l'agriculture	Ministério da Agricultura e Alimentação
Ministerio de Agricultura, Pesca y Alimentación	Ministère de la transition écologique	Ministério da Economia e Mar
Ministerio de Economía y Competitividad	Administrations régionales et locales	Ministério da Coesão territorial
Ministerio de Ciencia e Innovación		Ministério da Ciência, Tecnologia e Ensino Superior
Adminsitraciones autonómicas		Comissões de Coordenação e Desenvolvimento Regional
Administraciones municipales		Ministério da Administração Interna
		Municípios
Agents involved from civil society		
Agrarian unions/sectoral organizations/ NGOs		
Parents' association, catering companies, restaurants, tourism		
Consumer associations		
Research centers, universities and technical institutes		

References of good practices and inspiring experiences by country	
Spain	
ARCA. Asociación de iniciativas rurales de Catalunya	https://www.desenvolupamentrural.cat/
Alianza por un sistema agrario comarcal en la Vera	http://www.laveranosalimenta.org/
Red de Ciudades por la Agroecología	https://www.ciudadesagroecologicas.eu/
QueRed: Red Española de queserías de campo y artesanas	https://www.redqueserias.org/author/remedios-carrasco/
France	
Groupe professionnel Produits Laitiers Fermiers	https://idele.fr/detail-article/le-groupe-professionnel-produits-laitiers-fermiers
Plateforme Frais et local	https://www.fraisetlocal.fr/
Réseau Bienvenue à la ferme	http://www.drive-fermier.fr/
Association Agrilocal (restauration collective)	https://www.agrilocal.fr/
Portugal	
Queijos Centro de Portugal	https://queijoscentrodeportugal.pt/rota-dos-queijos/

- Key bibliographical references
  - Herrera, P., et al., 2018. La ganadería extensiva, una actividad clave para nuestra alimentación. Cuadernos Entretantos 4. Fundación Entretantos.

III. Lines aimed at improving management and handling

III. Improving the adaptability of livestock farms

▶ Problem / Challenge

Extensive livestock farming is an activity that, for years, has faced difficulties in terms of profitability, lack of generational change, lack of sectoral representation and general abandonment. But in addition to these difficulties, as they are livestock systems linked to the land and dependent on their environment, they must be considered more vulnerable to climate change. It is, therefore, key to approach a careful adaptation of the activity to climate change that improves the resilience and autonomy of the farms, but without this leading to even more fragility in the profitability of the farms.

It is important to bear in mind that, on the one hand, the reduction and greater irregularity of rainfall and the increase in temperature in Mediterranean areas will affect pastures and forage crops in a progressively more intense way in the coming years, for which mechanisms are necessary for improving livestock feed management. On the other hand, high temperatures and solar radiation are expected to affect the health and well-being of the animals, so mechanisms to care for the thermal and hydric well-being of livestock will have to be implemented. Lastly, the increased frequency of extreme weather events must be supported by agricultural insurance adapted to the new circumstances.

Given that many of the interventions aimed at adapting farms to climate change must necessarily be linked to greater care for soil, pasture, forage, shaded areas and water resources, it is important to point out that the land tenure regime is relevant because,

only with a view linked to the territory and with future perspectives, it will be possible to implement some of these measures of long-term care of the territory and its resources.

- Objectives
  - Improve training and advisory services (AKIS).
  - Strengthen and protect those characteristics of extensive livestock farming that make it per se an activity potentially adaptable to changes, such as livestock mobility and the use of rustic breeds.
  - Improve the management and protect those natural resources that guarantee the resilience of ecosystems in general and of livestock farms in particular, such as soil fertility, biodiversity, the quality and abundance of pastures and fodder, and water resources.
  - Protect and increase the natural and artificial elements that provide shade for both livestock and their feed.
  - Provide agricultural insurance or other economic protection mechanisms against damage caused by extreme weather events.

Actions necessary to improve the adaptability of livestock farms to climate change at the farm level	
III.A.1	Improve and strengthen training and advisory services (AKIS).
III.A.2	Improve the health management and welfare of animals by adapting health criteria to the specific characteristics of extensive livestock farming and adaptation needs.
III.A.3	Implement measures aimed at improving the management and surveillance of the appearance and transmission of emerging diseases. Promote biosecurity measures.
III.A.4	Promote the use and protection of rustic livestock breeds
III.A.5	Offer training and administrative and logistical facilities so that livestock mobility in search of fresh pastures and water resources is an easily accessible adaptation mechanism.
III.A.6	Provide tree farms and shelters for shade.
III.A.7	Implement training and support plans for the improvement of pastures and the inclusion of palatable tree and shrub plants.
III.A.8	Implement training and support plans aimed at improving forage autonomy on farms, optimizing hay production and storage.

III.A.9	Implement training and support plans to promote holistic management and rotational grazing, more actively controlling stocking rates, pasture regeneration and soil protection.
III.A.10	Raise awareness of the importance of soil care as a key resource for the sustainability of farms.
III.A.11	Implement legal and regulatory measures that put a brake on harmful practices for soil fertility and soil biodiversity.
III.A.12	Offer training and aid for the implementation of water corrections that prevent the loss of fertile soil (braking gullies).
III.A.13	Implement training plans and specific support for the incorporation and improvement of measures for the capture and storage of water on farms.
III.A.14	Offer training and administrative and logistical facilities.
III.A.15	Assess the application of more flexible regulations regarding the inclusion of new tree and grazing species better adapted to arid conditions and high temperatures.
III.A.16	Improve studies and the application of regulations for a better adjustment of stocking rates to the spatial and temporal characteristics of each type of pasture and exploitation.
III.A.17	Include the hunting population within the calculations of the stocking rate for a better management of land resources.
III.A.18	Integrate the needs for the use of fire in livestock farms with fire prevention plans, understanding that the use of fire can be a key ally in the management of some tree pests and in fire prevention itself.
III.A.19	Offer training and administrative and logistical facilities for the integration of agriculture and livestock as a synergistic alliance in the use of food resources and the management of soil fertility.
III.A.20	Implement mechanisms to facilitate access to communal pastures and forests, as well as to protected and reserved areas.
III.A.21	Implement coordination plans between livestock associations, associations of forest owners, communal land managers and municipal land managers (city councils) for a common and integrated territorial strategy.
III.A.22	Implement mechanisms to support pastoral and autonomous logics against the logics of dependency on inputs and globalization.
III.A.23	Improve the profitability of farms as a measure to improve their investment capacity in mechanisms for adapting to climate change.

Agents with key competences for their launching		
Spain	France	Portugal
Ministerio de Agricultura, Pesca y Alimentación	Ministère de l'agriculture	Ministério da Agricultura e Alimentação
Ministerio para la Transición Ecológica y el Reto Demográfico	Ministère de la transition écologique	Ministério da Coesão Territorial
Administraciones autonómicas	Administrations régionales et locales	Municípios
Administraciones municipales		
Agents involved from civil society		
Professionals and economic agents of the sector		
Agrarian unions/sectoral organizations/cooperatives		
Communal land managers and associations of forest owners		
Research centers, universities and technical institutes		

References of good practice and inspiring experiences by countries	
Spain	
Logotipo Raza autóctona	https://www.mapa.gob.es/es/ganaderia/temas/zootecnia/razas-ganaderas/arca/raza-autoctona.aspx
Agricultura Regenerativa	https://www.agriculturaregenerativa.es/manejo-holistico-3/
France	
Collectifs agroecologiques	https://collectifs-agroecologie.fr/
Vivea	https://vivea.fr/
UMT PSR	https://idele.fr/pilotage-de-la-sante-des-ruminants/
Veille sanitaire internationale	https://shiny-public.anses.fr/shiny-vsi/
Associations foncières pastorales	https://www.legifrance.gouv.fr/codes/section_lc/LEGITEXT000006071367/LEGISCTA000006152157/
Portugal	
Federação Nacional de Baldios	https://www.baladi.pt/

- Key bibliographical references
  - Collection of good practices for the adaptation of extensive livestock farming to climate change, from the LiveAdapt Project. Available at https://liveadapt.eu/publicaciones/.

III.B Improvement in water management according to the adaptation needs

▶ Problem / Challenge

The water footprint that is assigned to livestock is another issue for which the differentiation between livestock models is essential. The first thing to keep in mind when talking about the water consumption of a product is that the water footprint has three components: green water, which is rainwater that becomes part of the humidity contained in the soil and later in pastures and fodder; blue water, which is that accumulated in lakes, rivers and aquifers; and gray water, which is the fresh water required to assimilate the contaminants of an activity. According to studies by the Water Footprint Network, if we break down the water footprint of livestock production into these 3 components and according to the livestock model, we will see, for example, that 97% of the 22,000 liters allocated per kg of pasture-raised beef of the water used is green water (from rain) and only 1% is gray water. However, of 10,500 liters per kg of beef raised in an industrial system only 86% is rainwater and up to 7% is gray water. Therefore, the vast majority of the water used to produce meat is rainwater while a minority is limited freshwater or water that is polluted. In addition, it is important to point out that, to determine whether a volume of water use is sustainable or not, it is essential to compare it with the freshwater resources available in the territory.

Assigning a fair water footprint to extensive livestock farming, expressed in relation to the territorial availability of the resource and clearly differentiated from industrial livestock farming, which is associated with large impacts on water resources, is essential to supporting extensive activity through its implementation. in value.

Furthermore, and as we have already developed in previous sections, the close link between extensive livestock farming and land resources makes this an activity with specific adaptation needs in terms of the need for access to abundant and quality water. The scarcity and lack of potability of water is pointed out by the sector itself as one of the most worrying issues and that requires urgent and effective measures in order to adapt to climate change.

Essential measures such as improving the collection and storage of water that at first seem simple can encounter serious administrative obstacles and a lack of institutional support. Regarding access to sufficient water resources, the territorial organization of the member states has been shaping a complex reality in terms of jurisdictional delimitation in water matters and this structure becomes even more complex taking

into account the intersecting sectoral interests in this matter. As far as water quality is concerned, current regulations require the monitoring of the chemical and ecological status of surface water and the chemical and quantitative status of groundwater. However, the application of these regulations is often not at the height of expectations and, for example, in different European countries the contamination of aquifers by slurry from industrial livestock farming or agricultural toxic chemicals is the order of the day.

The diagnosis that emerges from the debates points to a necessary transformation of the water governance model in two fundamental directions: on the one hand, strengthening the coordination of sectoral policies and taking care of coherence between the different administrative levels and, on the other hand, promoting participation in decision-making, promoting cooperation and co-responsibility between the different sectors with the specific adaptation needs of extensive livestock farming to climate change. For this reason, dialogue between the administrations that have jurisdiction over the different sectoral policies and water policy is essential to build and implement coherent and synergistic interventions. In the same way, facilitating the involvement of the sector in the decision-making process related to planning and water management is essential to achieve coherent support for livestock activity and co-responsibility in the management of water resources by the agricultural sector as a whole.

- Objectives
  - Guarantee access to sufficient quality water for extensive livestock.
  - Promote and disseminate a fair water footprint for extensive livestock farming and clearly differentiated from the water footprint of industrial livestock farming.
  - Promote dialogue between the administrations that have jurisdiction over the different sectoral policies and water policy as a key to building and implementing coherent and synergistic interventions.
  - Facilitate the involvement of the sector in the decision-making process related to water planning and management in order to achieve coherent support for livestock activity and its specific needs for adaptation to climate change.
  - Promote the incorporation of techniques and practices to improve the more efficient collection and conservation of water on farms. These techniques may be common to those used for the conservation and improvement of fertile soils and those for the management of arboreal, shrubby and grazing vegetation for adaptation to climate change.
  - Take into account the link between livestock mobility and adaptation to the availability of water resources, support and facilitate livestock mobility.
  - Preserve and recover those traditional water management practices of great value for adaptation to periods of water scarcity.

Actions necessary to improve water management	
III.B.1	Train and promote water conservation and rational management in the primary sector, assuming responsibility for adaptation to a future scenario of greater aridity.
III.B.2	Promote the establishment of a fair water footprint for extensive livestock farming, clearly differentiated from the water footprint of industrial livestock farming.
III.B.3	Implement measures to improve governance in relation to the use and care of water resources, establishing lines of coordination and collaboration between the sector, water administration and environmental administration on one hand, and on the other, establish participation processes with the sector that make possible the inclusion of their needs when it comes to properly managing water resources.
III.B.4	Improve the control mechanisms over water quality, paying attention to polluting discharges and the use of illegal phytotoxic substances or those above the permitted levels.
III.B.5	Improve control mechanisms on the use of groundwater by controlling illegal drilling and rationing extraction volumes in legal drilling.
III.B.6	Improve technical support for the implementation of adequate territorial policies regarding water management.
III.B.7	Improve technical and economic support for the establishment on farms of the various mechanisms for adapting extensive livestock to climate change, including improving rainwater infiltration, water collection and storage on farms.
III.B.8	Raise awareness about soil health care as a basic mechanism to improve water infiltration and conservation and the maintenance of healthier and fresher pastures.
III.B.9	Improve knowledge and its application in terms of vegetation management and the need to conserve water, understanding that sometimes vegetation can be an ally in preventing evaporation of captured water, but on other occasions it can accelerate evapotranspiration and play a role as a competitor with water resources.
III.B.10	Improve knowledge and the applicability of mechanisms to improve the potability of water.
III.B.11	Support and facilitate the management of pastures to incorporate species with better water efficiency, also applying rotational grazing techniques adapted to the water availability of the pasture.

III.B.12	Promote the establishment of measures to control the access of wildlife to water sources used by livestock, both to avoid competition for the resource and the health problems it often causes.
III.B.13	Support and facilitate livestock mobility as a key mechanism in adapting to the availability of water resources and fresh pastures.
III.B.14	Identify, protect and recover those traditional water management practices of great value for adaptation to periods of water scarcity, such as key lines, mountain fisheries, ditch systems.
III.B.15	Identify and promote those water management practices that involve humble technologies, of free access and management and that respond to territorialized logics, adapted to the edaphic, climatic, geological and cultural context of the areas in which it is applied.

Agents with key competences for their launching		
Spain	France	Portugal
Ministerio para la Transición Ecológica y el Reto Demográfico. DG del Agua	Ministère de l'agriculture	Ministério da Coesão Territorial
Organismos de cuenca de la Dirección General del Estado	Ministère de la transition écologique	Ministério da Agricultura e Alimentação
Confederaciones hidrográficas	Administrations régionales et locales	Agência Portuguesa do Ambiente
Ministerio de Agricultura, Pesca y Alimentación	Agences de l'eau	
Administraciones autonómicas		
Agents involved from civil society		
Irrigation communities		
Consumer associations		
Professionals from the sector/ trade union organizations/ NGOs		
Research centers, universities and technical institutes		

References of good practices and inspiring experiences by country	
Spain	
Fundación Nueva Cultura del Agua	https://fnca.eu/
Proyecto MemoLab	https://memolaproject.eu/activities/hydrology
Líneas clave. Cosechando Agua, regenerando suelo	http://www.lineaclave.org/web/descripcion-de-la-linea-clave/
France	
INRAE	https://www.inrae.fr/
Portugal	
Alentejo Clima em Escassez hídrica	https://apambiente.pt/agua/alentejoclima-em-escassez-hidrica

- Key bibliographical references
  - De Stefano, 2020. Informe sobre mejora de la coordinación interadministrativa y reforma de los órganos de participación de la administración del agua. Libro Verde de la Gobernanza del Agua en España. Secretaría de Estado de Medio Ambiente del Ministerio para la Transición Ecológica. - Espín, R., et al., 2010. Manual del Acequiero. Agencia Andaluza del Agua Consejería de Medio Ambiente Junta de Andalucía.
  - Hoekstra, A., et al., 2011. The Water Footprint Assessment Manual. Setting the Global Standard.
  - Gac, A., Bechu, T., 2014. L'empreinte eau consommative du lait et de la viande bovine et ovine: premiers repères sur des systèmes français. Renc. Rech. Ruminants.

III.C Recognition, facilitation and support for livestock mobility

- Problem / Challenge

Livestock mobility, transhumance and transterminance, is a cultural system with a solid ecological foundation based on the use of the diversity of grazing systems at their optimum moment of production throughout the different seasons of the year, and this mobile livestock system has selected a set of breeds particularly adapted to this roaming. Furthermore, it is a system for managing natural resources and cultural, social, economic and biological interrelationships that has shaped many of the landscapes of Mediterranean Europe (and also of the Alps). In addition, livestock mobility generates

multiple environmental services and, in the context of climate change, represents great potential for adapting the activity to the foreseeable worsening of arid periods and pasture withering. Echoing all this, transhumance was inscribed in 2019 on the List of Representations of the Intangible Cultural Heritage of Humanity by UNESCO.
However, despite its importance, livestock mobility is currently a threatened and less frequent activity. Factors such as the imposition of policies that favor the intensification of production, health regulations that impose the inactivity of animals, the lack of generational change or the destruction and abandonment of the infrastructures necessary to carry out this activity, describe its current situation.

Given the great potential for adapting to climate change in extensive livestock farming, which represents the possibility of moving livestock for seasonal use of pastures and the search for sufficient water sources, it is clear that there is a need to correct the policies that are hindering the development of this activity and implement the necessary actions for its protection and promotion.

- Objectives
  - Improve knowledge to improve management: favoring the research and monitoring systems necessary to monitor the activity.
  - Train and sensitize both related technical personnel and society as a whole of the importance of livestock mobility.
  - Develop a regulatory and institutional framework that favors livestock mobility, correcting those aspects that are making its continuity impossible.
  - Set up incentive systems that favor the movement of livestock, both with direct support for the ranchers who make it possible and with support for the transfer of land that makes it possible.
  - Differentiate and promote animal products from transhumance.
  - Defend and recover livestock trails and their associated infrastructures.

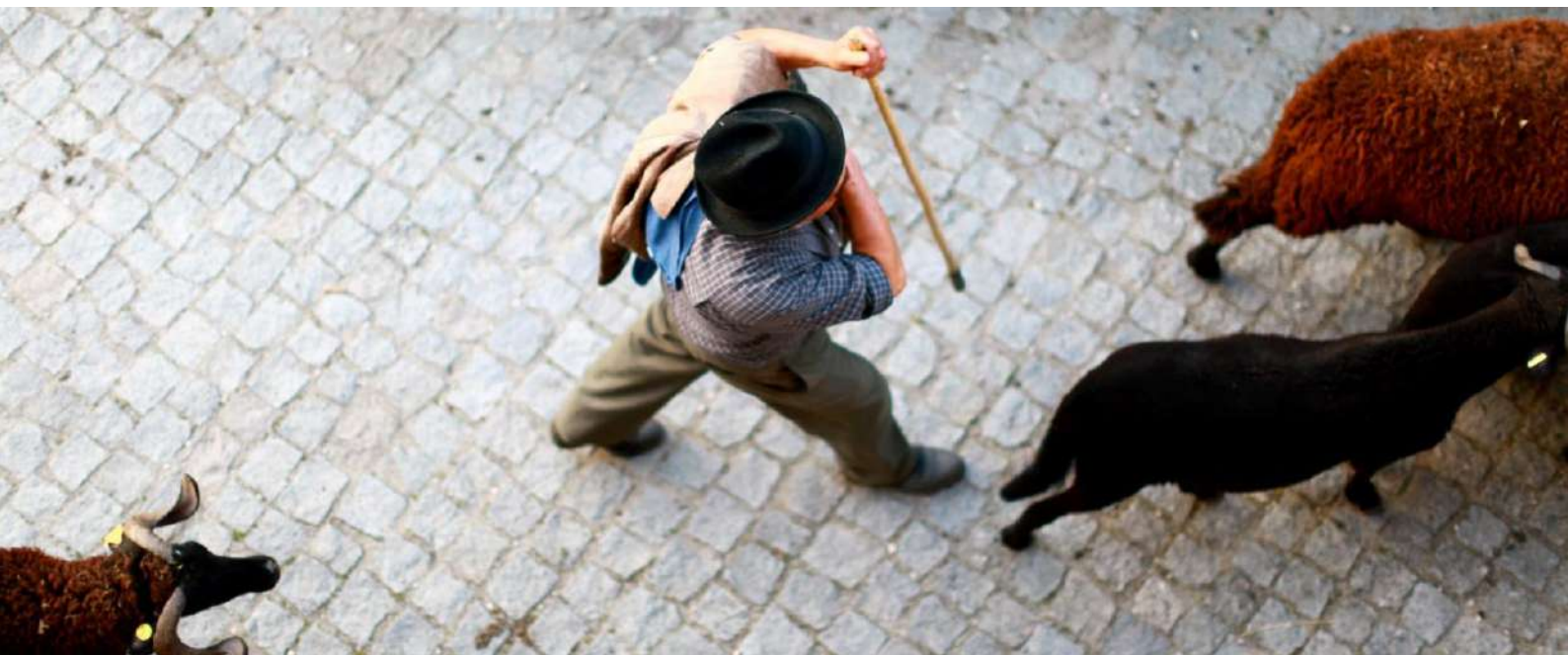
Actions necessary for the recognition, facilitation and support of livestock mobility	
III.C.1	Improve knowledge about transhumance (registration of transhumant farmers, identification of areas, valorization of environmental services, among other issues).
III.C.2	Promote the recognition of mobility as a fundamental characteristic of extensive livestock farming.
III.C.3	Organize and promote training plans for environmental agents and veterinarians on the importance of livestock mobility.
III.C.4	Promote social awareness and recognition of the cultural and environmental values of livestock mobility.
III.C.5	Promote and reward the transfer of private land for grazing.
III.C.6	Guarantee and promote the access of livestock to public and communal forests.
III.C.7	Design and promote training plans for shepherds for mobility.
III.C.8	Establish plans for the support, with adequate resources and personnel, for livestock mobility, evaluating the possibility of assigning assistant shepherds.
III.C.9	Promote studies and participatory processes aimed at identifying and correcting those regulations that are promoting more sedentary livestock farms and their simplification and intensification.
III.C.10	Establish and promote recovery plans for the lost ravines, as well as their associated infrastructure, such as water points, shelters, homes, closures or boundaries.
III.C.11	Promote the reform of those sanitary norms that imply the immobilization of livestock while incorporating sanitary certification mechanisms that facilitate livestock mobility.
III.C.12	Promote the specific recognition of the figure of transhumant shepherd.
III.C.13	Promote the recognition of transhumance as intangible heritage of humanity.
III.C.14	Prohibit and monitor the use of herbicides in livestock routes.
III.C.15	Prohibit and monitor the cementation of livestock roads.
III.C.16	Adapt the allocation of farm codes to livestock mobility, establishing a single code regardless of the location of the herd.

III.C.17	Review the regional standards for ecological certification so that they are consistent with the needs of mobile livestock, understanding the use of stubble fields, the use of communal forests or the use of pastures on the road between farms as a specific and necessary part of the activity.

Agents with key competences for their launching		
Spain	France	Portugal
Ministerio de Agricultura, Pesca y Alimentación	Ministère de l'agriculture	Ministério da Agricultura e Alimentação
Ministerio para la Transición Ecológica y el Reto Demográfico	Ministère de la transition écologique	Ministério do Ambiente e Ação Climáticas
Ministerio de Consumo	Administrations régionales et locales	Ministério da Coesão Territorial
Ministerio de Educación y Formación Profesional		Instituto da Conservação da Natureza e Florestas
Organismos de certificación ecológica		Gabinete do Planeamento, Políticas e Administração Geral
Administraciones autonómicas: sanidad y oficinas de la PAC		
Agents involved from civil society		
Agrarian unions/sectoral organizations/ NGOs		
Agrarian chambers/ rural development agents		
Professionals and economic agents of the sector		
Research centers, universities and technical institutes		
Consumer associations		

References of good practice and inspiring experiences by country	
Europe	
Shepherds Net: European Shepherds Network	http://shepherdnet.eu/
Spain	
Asociación Trashumancia y naturaleza	https://trashumanciaynaturaleza.org/
Plataforma "A Desalambrar" en defensa de vías pecuarias, caminos públicos y cauces.	https://www.adesalambrar.com/
Pastores por el Monte Mediterráneo	http://www.pastoresmonte.org/
France	
Démarche de reconnaissance de la transhumance comme Patrimoine culturel immatériel de l'Humanité à l'UNESCO	https://transhumance-patrimoine.fr/
Portugal	
Terras de transumância	https://terrasdatransumancia.pt/

- Key bibliographical references
  - Ministerio de Agricultura, Pesca y Alimentación, 2012. Cuadernos de la Trashumancia.
  - Ministerio de Agricultura, Alimentación y Medio Ambiente, 2013. La trashumancia en España. Libro Blanco.



IV. Lines for reinforcement of research and strengthening of the social fabric

IV.A Reinforcement of research, transfer and monitoring for the adaptation of extensive livestock farming to climate change

▶ Problem / Challenge

Reinforcing the lines of research related to the enhancement of extensive livestock activity and with the appropriate adaptation mechanisms to climate change could be considered a strategic line that is transversal to the previous 11 strategic lines developed in this document.

In this regard, it is important to emphasize that some of the necessary lines of research are of a technical-scientific nature, such as the study of the climatic responsibility of extensive livestock farming or its relationship with the maintenance of soil health. But other lines of research must have a more social perspective and address needs such as the compilation and updating of socio-cultural heritage linked to the improvement of resilience and the adaptation of extensive livestock farming.

In addition, the implementation of surveillance programs and adequate monitoring of territorial resources related to extensive livestock farming, as well as the impact that climate change is having on them, is vital as a support tool for technical-scientific research and management and coherent regulation of livestock activity.

- Objectives
  - Properly allocate funding and establish careful eligibility criteria for the establishment of lines of technical-scientific research that support the need for recognition of the environmental services of extensive livestock farming on the one hand and the needs for adaptation to climate change on the other.

  - Provide funding and promote the establishment of participatory research with a social perspective on extensive livestock that serve as a basis for the establishment of support programs and regulations consistent with the needs of the sector.

  - Support bidirectional knowledge transfer between research centers and the livestock sector.

  - Establish appropriate monitoring plans for the different aspects of extensive livestock farming that affect its viability and adaptability to climate change as an information base for adequate management and support of the activity.

5 courses were delivered in Spanish and Portuguese, during the project.

Title of the image: "Cycle of courses about extensive livestock farming and climate change adaptation".

Actions necessary to strengthen research, transfer and monitoring for the adaptation of extensive livestock farming to climate change	
IV.A.1	Funding for research and transfer on carbon footprint and life cycle analysis of extensive livestock.
IV.A.2	Funding for research and transfer on the water footprint of extensive livestock.
IV.A.3	Funding for research and transfer in terms of carbon sequestration in soils, their fertility and the relationship between livestock and the dynamics of edaphic organic matter.
IV.A.4	Funding for research and transfer in management of pastures and forage plants that are complementary and adapted to climate change.
IV.A.5	Funding for research and transfer in the field of water management.
IV.A.6	Funding for research and transfer in animal health in the context of climate change.
IV.A.7	Funding for research and transfer in the management of underground aquifer resources and water pollution.
IV.A.8	Funding for research and transfer on the hardiness of native breeds and adaptability to climate change.
IV.A.9	Funding for research and transfer of traditional socio-cultural heritage that can be used and updated for the adaptation of extensive livestock farming to climate change.
IV.A.10	Implementation of surveillance and monitoring programs for new diseases in animals and vegetation.
IV.A.11	Implementation of surveillance and monitoring programs for the use of pastures and their evolution in the context of climate change.
IV.A.12	Mapping, surveillance and monitoring of the state and use of cattle trails.
IV.A.13	Establishing scientific-technical commissions that support the administration for regulations and management consistent with current knowledge.

Agents with key competences for their launching		
Spain	France	Portugal
Ministerio de Ciencia e innovación	Ministère de l'agriculture	Ministério da Agricultura
CSIC (Consejo Superior de Investigaciones Científicas)	Ministère de la transition écologique	Ministério da Coesão territorial
INE (Instituto Nacional de Estadística)	Administrations régionales et locales	Instituo de Financiamento da Agricultura e Pescas
Ministerio de Agricultura, Pesca y Alimentación		
Administraciones autonómicas		
Agents involved from civil society		
Research centers, universities and technical institutes		
Agrarian unions and professionals in the sector		
NGOs		

References of good practices and inspiring experiences by country	
Europe	
EUROPEAN SOIL DATA CENTRE	https://esdac.jrc.ec.europa.eu/projects/lucas
Spain	
Mediterranean Mountainous landscapes. Memola Project	https://memolaproject.eu/es/proyecto/investigar
Basque Centre For Climate Change (BC3)	https://www.bc3research.org/
Proyecto InterReg Prodehesa-Montado	https://prodehesamontado.eu/
France	
Agence Nationale pour la Recherche	https://anr.fr/
CASDAR (Compte d´affection Spécial au Développement Agricole et Rural)	https://agriculture.gouv.fr/candidatez-aux-appels-projets-du-pndar
Alpages sentinelles	https://www.alpages-sentinelles.fr/
Portugal	
Centre for Ecology, Evolution and Environmental Changes.	https://ce3c.ciencias.ulisboa.pt/

Key bibliographical references

- Herrera et al., 2018. Huella ecológica, económica, social y sanitaria de la ganadería en España. Greenpeace.

IV.B Measures to reinforce the social fabric and governance to adopt an inclusive adaptation strategy at the sector level

Problem / Challenge

Land management at all levels necessarily entails the adoption of measures that affect the people who live and carry out their economic activity in that territory. While regulations, both European and national, have evolved and require the need to develop models of participation and governance in environmental and territorial planning, specifically in issues such as the fight against depopulation, rural development or the implementation of mitigation and adaptation measures, the truth is that the development of such processes is uneven in the different territories. Above all, it is not perceived as such by the livestock sector at all.

The extensive livestock sector, due to its socioeconomic characteristics, has enormous shortcomings that hinder its active participation in governance. This, originally arising from the individualism of the sector itself, from the absence of a participatory culture and due to its territorial dispersion, now has its roots in the almost total absence of networks and in the very destructuring and lack of representativeness of the sector, making it difficult to be represented in the participatory processes that concern it.

The lack of representation in decision-making regarding the policies and plans that affect them means that people in this sector have a very negative view of the role of administrations in the management of their land and their activity. In many cases this determines the difficulty of implementing management measures for adaptation that, were they discussed and agreed upon, would have much greater social and sectoral acceptance.

- Objectives
  - Promote the development of multi-stakeholder participatory processes in all territorial planning and management measures that affect the livestock sector, even tangentially.
  - Facilitate the creation of networks and the structuring of the extensive livestock sector both territorially and at the national and European levels.
  - Promote the culture of participation in the extensive livestock sector.
  - Promote the active participation of the extensive sector in the planning and management processes that concern them.
  - Facilitate the representation of the extensive sector in all the formal and administrative consultative and management spaces that exist in the territory (Boards of Natural Spaces or Parks, Local Action Groups, rural development, administrative monitoring bodies, etc.).

Actions to strengthen the social fabric and governance to adopt an inclusive adaptation strategy at the sector level	
IV.B.1	Promote and finance formal participatory processes and revitalization in rural areas for the implementation of sectoral associations and shared work spaces in the livestock sector.
IV.B.2	Integrate the extensive livestock sector through territorial representatives in the different management bodies of natural spaces (patronages), parks, etc.
IV.B.3	Provide greater transparency and generate information tools in relation to territorial planning and management that allow easy and useful access to all the information that concerns the sector.
IV.B.4	Generate and promote the appropriate conditions so that there is representativeness of the local livestock sector in territorial management. Promote monitoring bodies that develop monitoring, implementation, communication and governance tasks.
IV.B.5	Generate tools and processes for training, education and revitalization in the field of social participation.
IV.B.6	Promote a Monitoring Body, with budgetary allocation and legally standardized, for the development and implementation of this Action Plan made up of all the key agents in the sector.
IV.B.7	Develop communication campaigns that allow responsible technicians to approach good practices in relation to participation and governance in environmental, health, territorial management and planning, etc.

Agents with key competences for their launching		
Spain	**France**	**Portugal**
Administraciones autonómicas;	Ministère de l'agriculture	Ministério da Coesão Territorial
Ministerio para la Transición Ecológica y el Reto Demográfico	Ministère de la transition écologique	Ministério da Agricultura
Ministerio de Agricultura, Pesca y Alimentación	Administrations régionales et locales	Municípios
Agents involved from civil society		
Agrarian unions/sectoral organizations		
NGOs with activities to promote pastoralism		
Professionals and economic agents of the sector		
Pastoralist livestock associations		
Local Action Groups		

References of good practice and inspiring experiences by country	
Spain	
Plataforma Por La Ganadería Extensiva Y El Pastoralismo	http://www.ganaderiaextensiva.org/
Ganaderas En Red	https://www.entretantos.org/proyectos-entretantos/ganaderas-en-red/
Ramaderes de Catalunya.	https://www.facebook.com/Ramaderescat-787838001413853/
Nodo de conocimiento pastoralista de la FAO.	https://www.fao.org/pastoralist-knowledge-hub/es
Trashumancia y Naturaleza	https://trashumanciaynaturaleza.org/
France	
Démarche de reconnaissance de la transhumance comme Patrimoine culturel immatériel de l'Humanité à l'UNESCO	https://transhumance-patrimoine.fr/
Portugal	
Centro de Competências do Pastoreio Extensivo	https://pastoreioextensivo.pt/

- Key bibliographical references
  - Asín Semberoiz, J. 2015. Participación, gobernanza y políticas públicas. Fundación Entretantos.
  - Campos Fernández de Piérola, S. 2018. Gobernanza y participación en los comunes. Fundación Entretantos.

13. Quality indicators, follow-up and plan monitoring

Indicators are a key instrument for planning, monitoring and managing any action plan. They are therefore measurement elements that allow us to record information, with a series of variables that facilitate its interpretation and analysis, and that allow us to follow up and monitor.

As promised in the documents "F.2. Project activities and progress indicators Monitoring Plan" and "F.2. Quality Plan (QP)" all quality and progress indicators of Action C6 linked to the development of this Action Plan have been taken into account and adequately satisfied.

In addition, the project has been accompanied by an Environmental Impact Assessment Plan (D.1. Environmental Impact Assessment Plan) and a Socioeconomic Impact Assessment Plan (D.2. Socioeconomic Impact Assessment Plan).

In addition to the previous documents that have guided the project and that can be consulted on its website, for the development of this Strategic Action Plan, quality, follow-up and monitoring indicators have been established that are grouped around 3 aspects of the plan: the quality of the participatory process in its preparation, the adequacy of the strategic action lines proposed with respect to the objectives pursued by the SAP and the level of progress of the SAP over time. Some of these evaluation and follow-up indicators have been evaluated throughout the document construction process, others will be taken into account in the follow-up and monitoring of the document in the medium and long term.

Quality indicators of the participation process
Large number of participants incorporating an analysis of gender and professional sector.
Number and type of participation shares.
Inclusion of the ideas provided in the various participatory events in the text.
Communication in each event of the objectives and the previous steps in the participatory process.
Implementation of transparency measures of the participatory process: registration, sending and possibility of reply to all the participants of what happened in the event.
Evaluation of the level of satisfaction of the participants in the participatory events and in the final result of the process.
Proposals carried out with respect to the total proposals.

Indicators of adequacy of the actions proposed to objectives of the SAP
Correlation of each objective set out in the SAP with at least one line of action.
Correlation of each line of strategic action with at least one action.
Repeated monitoring of the text by the multi-agent group of experts.
Up-to-date and abundant scientific and technical bibliography on which the SAP is based.
Up-to-date European regulations that support the actions of the SAP.

SAP progress level indicators
Number of collaboration agreements.
Proposals carried out or advanced / total proposals (in the PAE as a whole and for each strategic line).
Number of farms/bioregions/states involved in the plan (spatial scale).
Number of months elapsed from the presentation of the plan to the implementation of each action (time scale).
Changes in the carbon footprint, water footprint and/or territorial footprint of extensive livestock farming.
Level of improvement in the profitability of the activity by region and/or type of livestock.
Evolution of employment in the sector.
Evolution of the social perception of the activity.

14. Transferability and replicability of the plan

Transferability serves to improve the development of the project and is implemented as a continuous process, aimed at benefiting all parties. The transferability of this strategic plan has been made throughout the entire development process of the LiveAdapt Project via different informative, training and participatory activities. The presentation and layout is in 4 EU languages: the 3 languages of the Mediterranean countries in which it is outlined: Spanish, French, Portuguese and in English, as it is the vehicular language in European communications. Both the transferability actions that have been developed throughout the development and consensus around this text and those planned for its dissemination are summarized in the following table:

Transfer actions throughout the construction of the SAP
Participation in the preparation/publication of the document "Extensive Livestock and Climate Change: an in-depth approach" in English and Spanish.
Prepared arguments for the future adaptation of the European Climate Change Strategy to the Green Deal.
Online training courses on adaptation of extensive livestock to climate change (Action C5).
Presentation of proposals to be included in the 2021-2025 Work Plan of the PNACC (National Plan for Adaptation to Climate Change, Spain).
Holding of various online seminars on different topics addressed in the SAP
Holding of various participatory and training workshops on different topics addressed in the SAP.
Communication and dissemination of the project and of the advances in the SAP through the website and the social networks linked to the project.
Transfer actions once the document is finalized
Signing of collaboration agreements with other entities from identified countries and sectors, to implement the project in various geographical areas in addition to those addressed in the project.
Presentation of the document at the I International Congress on Extensive Livestock and Climate Change (Córdoba, Spain).
Formal presentation of the document at the final conference held in Brussels.
Network dissemination of the document in Spanish, English, Portuguese and French.

The replicability strategies are intended to serve as multiplier elements of the PAE's impact. In this regard, it is worth noting as key actions throughout the development of the LiveAdapt Project:

Replicability actions
Publication of a Guide for the design of business models and logistics opportunities (Action C4).
Design of a marketing campaign for products derived from extensive livestock farming (Action C4).
Publication and dissemination of 30 Good Practice Sheets on adaptation of extensive livestock systems to climatic changes. All of them adapted, validated and transferred to local stakeholders in Spain, France and Portugal (Action C3).
Guide to proven innovative practices in improving pasture and animal health.
Participatory/training workshops in which inspiring successful experiences have been presented for the adaptation of extensive livestock farming to climate change.
Establishment of collaborations with different Life Projects related to the theme.
Webinar and dissemination of materials on successful and inspiring experiences.

In addition, this document, despite having a European territorial approach, has been designed for easy territorial escalation so that each proposed line of action is contextualized for the Mediterranean countries involved in the Action Plan (Spain, Portugal and France) but, In addition, derived from the way in which the document is designed, its replicability at the regional level is simple. Therefore, this document is conceived for community, national and regional replicability.

The information on transferability and replicability summarized in this section can be consulted more extensively in the document "C6. Replication and Transfer Strategy" that has accompanied the development of the LiveAdapt Project and that is publicly available on the project website.

15. Credits and participants

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16. Bibliographical references

- Asín, A., 2015. Participación, gobernanza y políticas públicas. Cuadernos entretantos 2. Fundación Entretantos.
- Collective authorship, 2009. Manual de Metodologías Participativas. CIMAS, Observatorio Internacional de Ciudadanía y Medio Ambiente Sostenible.
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