ResAlliance

A resilient future for Mediterranean landscapes

White paper on policy recommendations for landscape resilience in the Mediterranean region

Co-funded by
the European Union

Schweizerische Eidgenossenschaft
Confédération suisse
Confederazione Svizzera
Confederaziun svizra

Foreword

There are very few areas in the world where landscapes have been so profoundly shaped by traditional land management practices, resulting in a variety of cultural landscapes that support a rich diversity of species and ecosystems. Over centuries, civilisations and communities have transformed Mediterranean landscapes according to social changes and climate variability, keeping them resilient. However, the speed and intensity of these changes in recent decades are unprecedented. The Mediterranean basin is one of the world regions experiencing the fastest warming and the greatest decrease in rainfall, which aggravates climate-related disturbances. In the last decades, the population has become increasingly urban, particularly in North African and Middle Eastern countries, while cropland and rangeland have decreased, particularly in European mountain areas.

As in the past, Mediterranean communities must adapt their increasingly vulnerable landscapes - yet today, the urgency is greater than ever. These landscapes and associated cultural land management practices need to be able to withstand, recover from and transform in response to climate-related stresses and shocks, while taking into account climatic and socio-political uncertainties. Building resilience into these systems is no longer optional; it is essential.

Maintaining or enhancing landscape resilience is a collective responsibility shared by a diverse range of stakeholders. Some actions can be carried out independently by individual farmers, herders, and forest managers on their own land. Others require coordinated efforts across multiple properties, often facilitated by associations such as farmers' groups or forest owners' organisations. In certain cases, the involvement of civil society organisations is essential. However, to ensure the successful implementation and full effectiveness of these actions - whether managerial, technological, financial or governance-related - new or adapted policy instruments may be necessary, together with medium- and long-term action plans.

The ResAlliance project has identified, highlighted and internationally shared over 140 existing land management practices which may contribute to enhancing Mediterranean landscape resilience. However, many of these practices cannot be fully implemented unless countries or regions adapt their policies accordingly. This white paper on policy recommendations does not aim to propose changes to specific policy instruments required to implement each practice, but rather to provide guidelines for policy stakeholders (Box 1) to address Mediterranean landscapes resilience while supporting cultural practices and local communities. Given the interconnected nature of Mediterranean landscapes - which include croplands, rangelands, forests, urban areas and other ecosystems - sectoral policymakers must collaborate to design integrated policies that account for cross-sector impacts at the landscape level, with careful consideration of climate change. Although this white paper on policy recommendations has a Mediterranean focus, its recommendations are also valid across Europe and other regional contexts.

"ResAlliance is one of the few EU-funded projects that brings together farming, livestock and forestry sectors, because the resilience of our landscapes does not stop at the edge of the forest or at the margin of our fields."

Eduard Mauri,
coordinator of ResAlliance project

Box 1
Stakeholders addressed by this policy paper

- Members of Parliaments, policymakers, policy stakeholders, agency officers, and researchers at the European Union level.
- National, subnational, and local Authorities along the Mediterranean.
- Societal actors: Civil Society Organisations, professional and landowner associations, private and business sector, capable of promoting resilience in Mediterranean landscapes.

Recommendations on this policy paper are presented from page 8 on, under four headings that provide a systemic integrated vision

I One Mediterranean Basin, diverse landscapes: Integrate the resilient landscapes framework across all sectoral policy domains
II Promote sustainable management of cultural landscapes and the implementation of nature-based solutions
III Sharing, scaling up, and replicability: blending traditional knowledge and innovation for future resilience
IV Policies and public-social-private partnerships for Resilience Financing.

Major Impacts of Climate Change on Mediterranean Landscapes[1]

The Mediterranean region is often considered to be the cradle of civilisation. Nowadays, it is one of the most densely populated areas on the planet, and also one of the most biodiverse. Its climate is characterised by hot, dry summers and mild, wet winters. Climate models consistently project Mediterranean regional warming at rates about 20% above global means and reduced rainfall (–12% for a global warming scenario of 3°C). In fact, the current surface temperature in the region is already 1.5ºC higher than pre-industrial times, 0.4ºC above the global average. In terms of aridity, existing models project a significant increase, and a corresponding loss of 11–25% of the Mediterranean biome area (Figure 1) by the end of this century and a loss of area in the Mediterranean biome in the range of 11-25% by the end of this century due to aridity and the advancing of desertification. Climate change is likely to reduce crop yields in many areas, mainly due to higher temperatures and less water available, affecting crop phenology and the shortening of the growing season. Specific risks are projected for cereal, rice, olives, vegetables, fruit trees, grapevines, and dates.

All the above is already having significant effects on plants, animals, and people, thus influencing and shaping the entire Mediterranean socio-ecological system. Consequently, the Mediterranean Basin is considered a 'Climate change hotspot'. Climate change impacts, however, are diverse and have interacting, cumulative, and cascading effects. Increasingly high temperatures also enhance evapotranspiration, reducing water availability and provoking longer dry spells. More frequent and more prolonged heat waves also increase land and sea temperature, creating more extreme rainfall events and flash floods.

All of these affect Mediterranean territories simultaneously and pose significant risks to biodiversity, food security, societal well-being, and cultural heritage. Additionally, migration fluxes and geopolitical instabilities increase both exposure and vulnerability of Mediterranean socio-ecological systems. Still, solutions exist, and there is a growing consensus among practitioners, experts, and academia that building socio-ecologically resilient (SER) landscapes is a pressing need across the region. However, the practical implementation of solutions remains limited to date and faces numerous barriers today[2].

Box 2
Two definitions by ResAlliance[3]

Landscape means an area, as perceived by people, whose character is the result of the action and interaction of natural and/or human factors[4].

Landscape resilience refers to the ability of landscapes to endure, adapt, and transform under changing conditions while maintaining their core structure, functions, and identity[5]. Resilient landscapes can adapt to changing conditions, maintain their essential ecological functions, support biodiversity, and withstand and recover from disturbances like climate change impacts and human activities, while continuing to provide valuable ecosystem services.

Resilient systems are characterized by diversity, redundancy, connectivity, integrity, flexibility, participation, polycentric and multi-layered governance, and accountability.

1 *Sources: ResAlliance materials; Peñuelas, J.; Sardans, J. 2021. Global Change and Forest Disturbances in the Mediterranean Basin: Breakthroughs, Knowledge Gaps, and Recommendations. doi:10.3390/f12050603; Ali, E. et al., 2022 (IPCC): Cross-Chapter Paper 4: Mediterranean Region. In: Climate Change 2022: Impacts, Adaptation and Vulnerability. doi:10.1017/9781009325844.021*

2 *Rodriguez Fernández-Blanco et al. 2022: doi.org/10.1016/j.forpol.2022.102719, 2024: doi.org/10.1080/09640568.2024.2342333, and as a general source: https://www.resalliance.eu/resources/*

3 *A more detailed description is provided in Pingault N., Martius C., 2024. Resilience thinking: a brief overview. ResAlliance. Project Infobrief 1, 10 pp. EFI, Barcelona.*

4 *Definition adopted from the Council of Europe Landscape Convention (2000). https://www.coe.int/en/web/landscape*

5 *Nathanaël Pingault, N. and Martius, C. 2025. Resilience thinking for the Mediterranean basin. CIFOR-ICRAF. DOI: 10.17528/cifor-icraf/009380.*

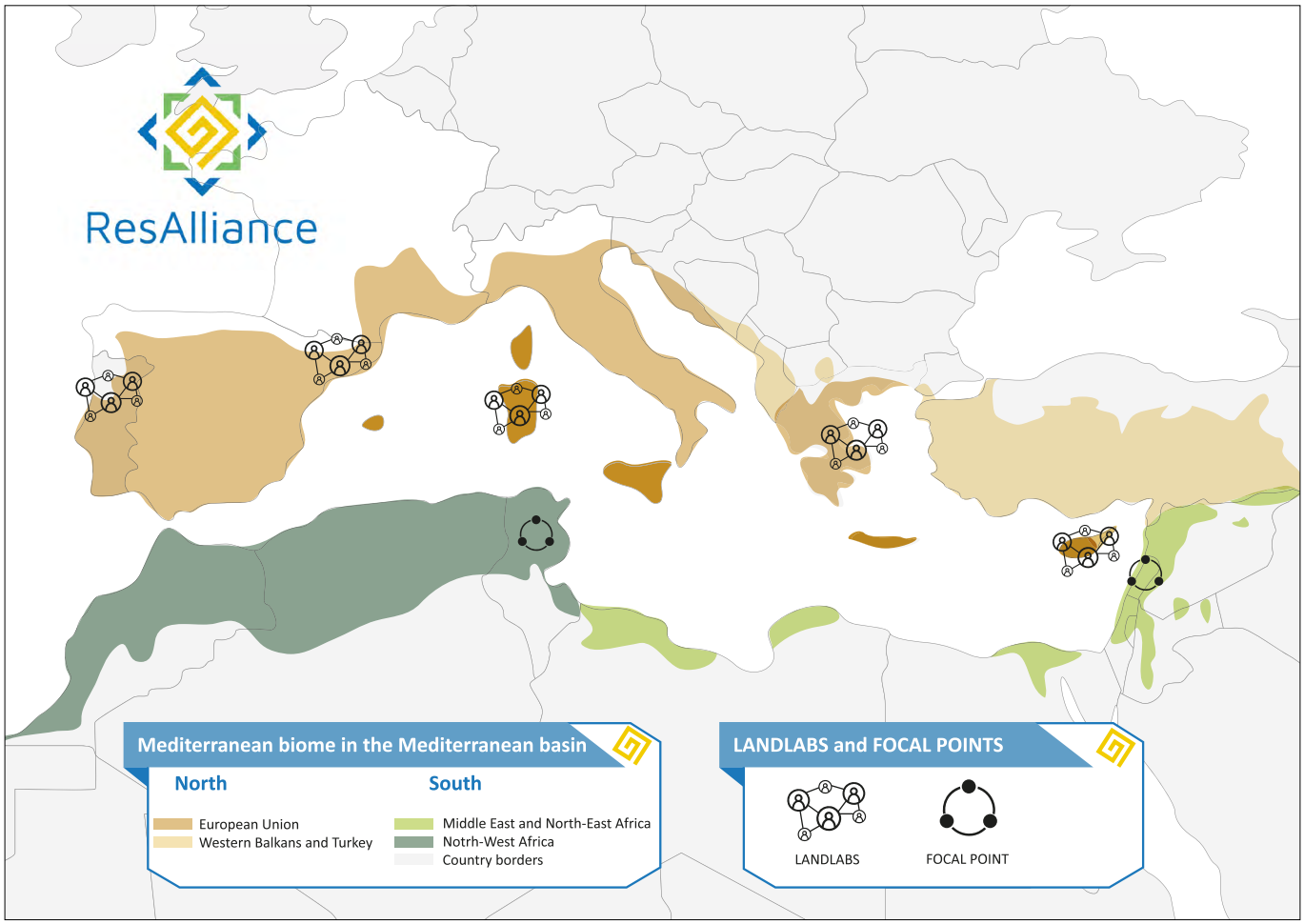

Figure 1. The map illustrates the current extent of the Mediterranean biome - the geographical focus of this policy paper (as defined by Malek 2018) and marks the locations of ResAlliance's LandLabs and Focal Points that have sourced project knowledge and recommendations. It is important to note that the ecological boundaries of ecosystems and agroclimatic zones shown on this map may shift under future climate change scenarios. Source: Pau Costa Foundation (own elaboration).

Figure 2. Capturing all dimensions of landscape resilience in a single image is impossible, as factors such as scale, governance, financing, or social context are challenging to represent visually. The pictures above present one clear example: an all-burnt landscape, with low and slow resilience (left, 2025 Llamas de Cabrera wildfire, picture Virginia Carracedo/Pau Costa Foundation), and a more resilient landscape, with vineyards buffering the progression of fire and facilitate an easier recovery (right, 2019 Torre de l'Espanyol wildfire, picture Oriol Pellissa/Pau Costa Foundation).

Understanding the challenges to create resilient Mediterranean landscapes

Building socio-ecological resilience comprises several challenges across Mediterranean landscapes, which we group in the following four domains to then present the recommendations.

One Mediterranean Basin, diverse landscapes

Integrate the resilient landscapes framework across all sectoral policy domains

The Mediterranean Basin encompasses a great diversity of socio-ecological realities. Currently, policies and legislation across Mediterranean countries are often complex, contradictory, or outdated, while challenging political and administrative contexts hinder effective management. Policies for landscape resilience need to be developed in response to these different contexts and integrate the various needs for landscape resilience, in some instances fostering innovative land uses and land planning, and in other cases supporting the existing land management systems that provide resilience to Mediterranean landscapes, some of them in decline. The European Union policy framework is especially prominent and can bring reflection to other Mediterranean countries planning to develop new innovative policies.

Structure in the form of jessour. Construction of earth dikes reinforced with stones in thalwegs: Water conservation practices (author: Tunisian Ministry of Environment and Sustainable Development, ©Tunisian Ministry of Environment and Sustainable Development).

Promote sustainable management of cultural landscapes and the implementation of nature-based solutions

Public administrations usually lack coordination between the different territorial levels (vertical coordination) and across various sectors (horizontal coordination), typically expressed as working in siloes. This is a challenge when landscape resilience solutions need the aligned involvement of local, regional and national administrations, as well as the collaboration between different areas of activity (agriculture, forestry, nature conservation, social and economic development, etc).

Moreover, some popular terms at the policy level, such as nature-based solutions (NbS), remain unclear and therefore difficult to understand and implement. The lack of a clear catalogue of NbS prevents a proper management by public administrations.

The Mediterranean region is also not exempt of the market-driven logic of financial decisions. And the fact that environmental externalities are often not part of the market equation and intensive production systems, and intensive production systems also play against the maintenance of traditional cultural landscapes. Traditional cultural landscapes are not quantified in monetary terms; therefore, the value of the resilience that these landscapes bring is difficult to assess and to capture by landowners. The concurrence between close-to-nature, extensive primary sector activities (less productive and profitable) and intensive production systems causes the disappearance of the former.

Sharing, scaling up, and replicability
Blending traditional knowledge and innovation for future resilience

Knowledge transfer is essential for building resilience. However, languages across the Mediterranean countries often pose a communication challenge.

Many resilience practices are developed in contexts where there is no mandate for international dissemination, replication, or scaling up. The differences in the policy context between EU and non-EU countries in the Mediterranean may be a challenge when internationally replicating some particular practices, as well as the heterogeneity of existing extension services and innovation advisory across countries. The lack of political stability and short-term political vision results in the absence of regular funding to support the permanent exchange required to share, scale up, and replicate landscape resilience practices, in particular across borders.

Policies and Public-Social-Private Partnerships (PSPP) for Resilience Financing

While subsidies are well-known and broadly used for financial support, public-social-private partnerships (PSPP) and payment for ecosystem services (PES) are less well-known and less widely used as financial solutions to develop resilient landscapes. The implementation of PSPP is laborious, as it needs to align different objectives, priorities, and motivations, and they have complex governance schemes, and extra efforts are required to ensure accountability, transparency, monitoring, and evaluation (among other challenges). The implementation of PES is difficult due to the complexity of who can provide and who should pay for these PES. At the same time, evaluation of ecosystem services is technically complex, and often there are no established markets or consistent market sources.

Enhanced landscape resilience is gaining traction as a way to address the so-called 'triple challenge': a) ensuring the well-being of a growing global human population, while b) adapting to climate change, mitigating its consequences, and c) reversing biodiversity loss and ecosystem degradation.

Institutionalised co-production is a global concept used in "unorthodox public service delivery in challenging environments". We propose its application in landscape resilience by means of providing public services (including development of regulations) through a regular, long-term, equal, and reciprocal relationship, becoming far more effective agents of change[6].

The adoption and implementation of an approach to building landscape resilience is complex due to the diversity of stakeholders across the land (landowners, users, managers and other private actors, often small, civil society, and academia), the relation to the landscape in multiple rural activities, and the lack of resources by the public agencies to deliver services for resilience effectively. Institutionalised co-production necessarily includes a common agreement on the balance of power at personal as well as organisational level, between public administration, social groups and private actors, by involving people in the delivery of the services and resources of their own need (fire prevention, restoration and landscape management, water protection, recreation or primary production, e.g. ◊ Kythira Island, Greece, cooperative wildfire prevention). Education, training, monitoring, and assessment of the application of solutions for enhancing landscape resilience are key elements of the proposed approach. To complete this new vision, it is necessary to recognize people as assets and promote reciprocity among specialized and capable individuals. Once co-production, via co-planning and co-delivery of landscape resilience solutions, is in place, a complex and adaptive, completely new system can emerge.

Honey bee collecting honeydew (author: M. Carmen Seijo Coello, © Educational use, non-commercial).

6 *Own definition based on Joshi, A., & Moore, M. 2004. Institutionalised Co-production: Unorthodox Public Service Delivery in Challenging Environments. The Journal of Development Studies, 40(4), 31–49. DOI: 10.1080/00220380410001673184, and https://www.nesta.org.uk/report/the-challenge-of-co-production/ (2013).*

Towards resilient futures
Actionable policy recommendations for Mediterranean landscapes & communities

The Mediterranean Basin is not defined by a single landscape, community, or culture; instead, it includes a rich mosaic of diversity, shaped by varying degrees of human management and interventions. The following recommendations are intended to be expanded, adapted, replicated, and scaled across diverse Mediterranean contexts through collective, co-creative leadership, driven by the active engagement of all stakeholders. There is no one-size-fits-all solution for Mediterranean landscapes, and thus, the resilience-building process needs to be undertaken through place-based approaches.

The recommendations can be of interest by three general types of stakeholders connected to the policy process (see Box 1). Each of the thirty-eight recommendations may have a perspective of interest to the different stakeholders who, by agency, and taking ownership, will decide on those of most interest for them at a certain time.

The policy recommendations aim to support the implementation and strengthen different types of solutions that are to be sustained and enhanced during the resilience learning process Several of these recommendations require *"out-of-the-box thinking"* for their implementation. Readers are encouraged to study them and engage in open discussions from this perspective.

Box 3
Best practice examples for the resilience of Mediterranean landscapes

The ResAlliance Factsheets Compilation includes 120 ready-to-use, replicable, and scalable solutions for resilience, many of which are highlighted with the symbol ◊.

I. One Mediterranean Basin, diverse landscapes
Integrate the resilient landscapes framework across all sectoral policy domains

To build socio-ecological resilience, policies must actively expand the governance space, fostering experimentation and co-management initiatives. Support for public-social-private partnerships, cross-institutional collaboration, and grassroots initiatives are different ways forward to activate the social fabric.

In Heading I, ResAlliance proposes

I.1 Enrich the main European strategies and regulations for climate, biodiversity, water, agriculture, and forestry with provisions targeted explicitly at improving landscape resilience, in line with the project's findings and these recommendations. This includes the Green Deal framework, regarding its *"transformation of agriculture and rural areas"* and "towards a modernised and simplified CAP", as well as the National Nature Restoration Plans, and the new European Roadmap towards Nature Credits[7].

I.2 Explore, share, and exchange advanced and innovative policies and regulations that have proved helpful to increase landscape resilience. Special attention should be paid to legal frameworks in countries where updates are necessary. Policy innovation must be developed to address complex challenges and bottlenecks, breaking out from fragmented and siloed policy governance, increasing cross-sectoral collaboration across ministries and with different stakeholder groups.

I.3 **Take an integrative approach to** the overall policy framework, as the most efficient global management strategy to conserve soil quality and biodiversity, prevent wildfires, ensure adequate forest cover and carbon storage, maintain forest quality, and favour regeneration in current Mediterranean landscapes. Much of this approach is rooted in cultural, sustainable Mediterranean land management practices that have provided multiple benefits for centuries and should be encouraged and supported through the promotion of synergies, best practices, and networking to ensure the continued presence of active rural communities, a key factor in building resilience.

I.4 **Promote mosaic landscapes** with native and climate-migratory forest species, moderate forest thinning and livestock grazing, prescribed burning, complemented by the maintenance of cropland, agroforestry, keyline planting, and traditional terraces, in a diverse mosaic landscape, while reducing cropland in marginal areas and grazing on degraded slopes. Policies favouring the above can help with effective fuel load management and the avoidance of depopulation and land abandonment[8].

I.5 **Use a hierarchical landscape planning** at different scales for the management of natural areas, including: i) a large-scale plan that considers the combination of regions of various types, multiple users, and the effects of disturbances, such as forest fires, flooding, and especially drought (e.g. ◊ island-wide Gran Canaria Mosaico initiative, Spain); ii) a smaller scale of action using exchange of knowledge with effective and advanced tools, education, networking and institutionalized co-production for socio-ecological resilience and adequate management of their territories[9] (e.g. ◊ Model Forest Initiative, Middle Atlas, Morrocco; ◊ Community based resilience in Oued Zeen, Tunisia; ◊ Forestry agreements and land associations, Italy.).

I.6 **Address specific land management challenges under different tenure regimes**: Private, rented, public, and communal lands (e.g., baldios in Portugal, kinotikí yi in Greece, and mushā in the Arabic Mediterranean) all have unique planning and management challenges for landscape resilience, which specific policy and management solutions must address. Notably, almost 50% of farmland is rented in the EU, and it requires facilitating and promoting land restoration activities within rental agreements.

I.7 **Provide open-access Land Parcels Identification Systems** (LIPS). Complete and accessible LPIS (e.g., SIGPAC in Spain) are essential for landscape, climate, and water resilience modelling. Governments in the EU have obligations regarding the reuse of public sector information and the promotion of sharing geospatial data for environmental policies and initiatives[10].

I.8 **Make the fight against rural abandonment** a key piece for maintaining diverse landscapes. Promote measures to facilitate the return of people to rural areas, especially involving youth and women in entrepreneurial initiatives for landscape resilience, for example, through living labs, Agricultural Test Spaces, integrated landscape management incubators, or land access programmes[11].

I.9 **Increase the adoption of agroforestry practices** through more targeted advisory support. Training, advisors, monitoring, and inclusion in voluntary carbon farming certification (◊ Carbon farming in the EU) are essential steps.

I.10 **Maintain an updated compilation** of demonstrations and good practices and make them widely available[12], including training through a knowledge and innovation community of practice at the Mediterranean level and beyond.

Vineyards in Agros (author: Tsiakkas Winery, © Educational use, non-commercial).

7 *Communication from the commission to the european parliament, the council, the european economic and social committee and the committee of the regions. Roadmap towards Nature Credits COM/2025/374 final. https://environment.ec.europa.eu/publications/roadmap-towards-nature-credits_en*

8 *See A resilient future for Mediterranean landscapes - Landscape resilience blueprint for the wider Mediterranean region for more detailed and management practice orientations on these. See further information at the end.*

9 *Adapted from Peñuelas, and Sardans (2021), see citation 1.*

10 *European Commission. 2024. Unlocking the potential of high-value datasets: The impact of the HVD implementing regulation. https://data.europa.eu/en/news-events/news/unlocking-potential-high-value-datasets-impact-hvd-implementing-regulation*

11 *E.g. Access to Land network (A2L) https://www.accesstoland.eu/*

12 *ResAlliance Factsheets Compilation is permanently stored in EU-FarmBook, a European open-access platform for rural knowledge and innovation.*

II. Promote sustainable management of cultural landscapes and the implementation of nature-based solutions

Sustainable land management of agro-silvo-pasture mosaics, together with Nature-based Solutions (NbS) that are related to cultural practices, compose a framework for future resilience in the Mediterranean, with adequate support from the CAP and other public/private funds (see IV). Institutionalised co-production, and shared responsibilities for land management and NbS between actors are fundamental to tackling risks at the landscape level. A large body of NbS already exists and is ready to be applied, many of which originated from solution-makers in Traditional Ecological Knowledge (TEK). Innovative and advanced policies, grounded in the co-production of research with traditional and academic knowledge from many projects and sources, will play a fundamental role in boosting sustainable land management and NbS in the Mediterranean.

Some examples of effective traditional techniques for water conservation in dry Mediterranean landscapes are the ◊ Tabias and Jessour (Tunisia) and ◊ Loutses (Greece). Other examples are ◊ vineyard buffers for wildfire prevention (Catalonia, Spain), ◊ hedgerows against desertification (Cyprus), and a solution combining technology and traditional practices: ◊ GPS collars for targeted grazing, for fire prevention and land restoration (Serra do Alvão, Portugal).

In Heading II, ResAlliance proposes

II.1 **Use the ResAlliance Blueprint**[13] as a guidance to improve resilience through specific sustainable land management practices and NbS frameworks for Mediterranean Landscapes.

II.2 **Support reforestation, afforestation, and assisted natural regeneration (ANR)**, mainly in semi-arid and/or burned areas, to conserve soil, carbon, and nutrients in the system, and ensure these are appropriately managed to avoid as many impacts as possible. The election of planted species must consider the future climate regimes and the maintenance of the plantation.

II.3 **Connect the Common Agriculture Policy** to local policies supporting sustainable soil management practices at the farm and landscape level. This includes monitoring, and the new EU nature credits (see I.1), and strengthening the compatibility of interventions supported by Member States with the JRC Classification of Farming practices (JRC 2024). Greater understanding is needed of the effects of existing CAP interventions on the health of biodiversity, ecosystems, water, nutrient cycles, and soil erosion.

II.4 **Ensure the protection and maintenance of traditional cultural landscapes** that, while ecologically resilient, are often abandoned under market pressure; for example, dry-stone terraces revert to homogeneous forests, and degrading walls accelerate erosion.

II.5 **Promote the maintenance of forest patches and other landscape features** between croplands in rural areas, which increases resilience, reduces risks, and benefits biodiversity.

II.6 **Develop an Integrated Fire Management approach**, avoiding fire suppression policies that exclude the use of fire in the Mediterranean landscapes. Increase preventive measures based on the reduction of vegetation density of Mediterranean forests, encouraging sustainable forest management and restoring the use of fire as a cultural and ecological practice.

II.7 **Improve the support for regenerative/ agroecological practices**, by developing and adapting the sanitary livestock regulations to promote extensive farming systems.

II.8 **Use narratives** to make evident to decision makers and investors how advanced agroecology practices can serve as a resilient strategy that does not compromise yield or food security.

II.9 **Define water resource** exploitation strategies, effective monitoring of drought effects, characterization of water requirements for different species and landscapes, and assessment of direct and indirect climate change impacts on social dynamics. All of these, in connection with the EU Water Resilience Strategy[14].

II.10 **Implement technologies** on mapping, remote sensing, stationary weather and climate data tools, and production system simulators such as APSIM[15], based on dynamic assumptions from climate data.

II.11 **Map national farming practices for resilience** against a common standard, for example, the classification of farming practices of the JRC[16] together with the Platform of CAP interventions[17].

13 *See A resilient future for Mediterranean landscapes - Landscape resilience blueprint for the wider Mediterranean region for more detailed and management practice orientations on these. See further information at the end.*

14 *Communication from the commission to the european parliament, the council, the european economic and social committee and the committee of the regions European Water Resilience Strategy. COM/2025/280 final*

15 *Agricultural Production Systems sIMulator (APSIM). https://www.apsim.info/*

16 *Angilieri, V., Guerrero, I., Weiss, F. 2024. A classification scheme based on farming practices. https://publications.jrc.ec.europa.eu/re pository/handle/JRC133862*

17 *Catalogue of CAP Interventions Database. https://agridata.ec.europa.eu/extensions/DashboardCapPlan/catalogue_interventions.html*

III. Sharing, scaling up, and replicability
Blending traditional knowledge and innovation for future resilience

Solutions for landscape resilience are already available (Box 3). What is now needed are sufficient resources and clear strategies to make solutions widely transferred and adopted. At the same time, innovation requires overcoming initial resistance and risk-aversion attitudes to new practices. For its part, fostering scalability, including scaling up, out, and deep[18], is essential for landscape resilience transformations to be implemented in large areas. (e.g. ◊ Panasqueira aggregated forest, Portugal). In addition to replicability, with the overall goal to spread and adapt solutions in other places along the Mediterranean. Experimental and cultural practices knowledge (e.g. ◊ Mandra Agropastoral System, Lemnos, Greece) combined with innovation through living labs, incubators, and start-ups, is the way forward, with cooperation between the South and North Mediterranean shores, and a multi-actor and bottom-up approach. Clear communication is critical for bridging the science-policy gap and promoting public understanding through proactive storytelling, dedicated panels, and ambassadors to convey solution-oriented messages.

In Heading III, ResAlliance proposes

III.1 **Make extension services and innovation advisors available** for agriculture and forestry management. These are essential for effectively promoting and implementing sustainable practices, NbS, and financial solutions, connected, for example, to the CAP and soil monitoring directive.

III.2 **Capitalise on knowledge** by improving it through living labs, lighthouse initiatives, spin-offs, start-ups, or rural development groups. The FASTER project in Tunisia is a good example of knowledge transfer through a living lab multi-stakeholder platform[19].

III.3 **Improve** internet coverage and accessibility of existing technologies or low-tech adaptation to small agri-forestry businesses, paired with open data and knowledge sharing across sectors and through adequate tools, knowledge, and data.

III.4 **Promote technology** as a supportive tool, adjusting expectations to capacities, while providing capacity building across generations, to help stakeholders effectively adopt and utilize technology.

III.5 **Empower women and youth** agricultural development groups with adequate autonomy and material capacity for successful scaling-up of initiatives across territories[20].

III.6 **Scale-up proved solutions** by implementing co-management strategies. For example: community-based natural resource management systems where stakeholders can develop effective cultural and governance practices (e.g., ◊ the Ifrane Model Forest Initiative, Middle Atlas Mountains, Morocco).

III.7 **Promote innovative digital tools**, where capacity exists, to scale up resilience, like the Farm Sustainability Tool – FAST[21] and a geospatial version of the Agri Sustainability Compass[22], based on integration of LPIS Data[24].

III.8 **Explore tools** like *"shared agendas for sustainability and social change"*, which are an adequate methodology of participatory governance based on the collective action of diverse actors addressing a common challenge in a landscape[23].

A young agricultural entrepreneur visits the farm of a landowner who is eager to find a generational successor to his activity (author: Patxi Uriz, © Barcelona Provincial Council).

18 Moore M-L, Riddell D, Vocisano D (2015) Scaling out, scaling up, scaling deep: strategies of non-profits in advancing systemic social innovation. J Corp Citizsh 2015: 67–84.
19 EU Space Data Platform for Sustainable Farming. https://fastplatform.eu/
20 Promotion des groupements féminins pour la sécurité alimentaire et la génération de revenus en Tunisie (PFR). https://gender-works.giz.de/competitions/tunisia-promotion-des-groupements-feminins-pour-la-securite-alimentaire-et-la-generation-de-revenus-en-tunisie-pfr/
21 https://fastplatform.eu/
22 https://agridata.ec.europa.eu/extensions/compass/compass.html
23 See reference 20 above. https://fastplatform.eu/
24 Agri Sustainability Compass. European Commission. https://agridata.ec.europa.eu/extensions/compass/compass.html
25 Fernandez T. et al. 2020. Articulating shared agendas for sustainability and social change. "RIS3CAT Monitoring" Collection, 8. Government of Catalonia. https://record.bibliotecadigital.gencat.cat/bitstream/handle/20.500.14345/1117/08-monitoratge-ris3cat-agendes-compartides-en.pdf?sequence=6

IV. Policies and Public-Social-Private Partnerships (PSPP) for Resilience Financing

Resilience financing is a fundamental catalyser for resilient landscapes in all different types of capital, credit, and subsidies, with appropriate size and interest rates, incentives, long-term cycles, and accessibility without political or other interference. Public funding in the fields of forestry, agriculture and rural development is primarily sourced from the Common Agricultural Policy funds, with funding for environmental action, research, and territorial cooperation at a complementary level. In East and South Mediterranean countries, international, non-EU collaboration also plays a vital role. CAP regulations and funding programmes after 2027 must ensure adequate incentives for agro-silvo-pasture mosaics for the strategic maintenance of resilient landscapes, showing in parallel the associated return in risk and disaster reduction. The private sector, particularly tourism, as well as impact investment in innovative landscape solutions, must take a medium-long-term key role in the financing equation for NbS and sustainable management practices (e.g. ◊ Innovative governance & finance of water NbS, Brenta River, Italy; ◊ BioClima: integrating public and private financing for natural capital conservation, Lombardy, Italy).

The social component of Public-Social-Private partnerships is essential for fully leveraging opportunities, fostering entrepreneurship, and driving social innovation within the framework of institutionalized co-production. ◊ FireFlocks, (Catalonia, Spain) promotes forest management through extensive grazing to reduce the risk of wildfires, supported by subsidies now transitioning to ecosystem services payments. The ◊ NGO Jouzour Louban (Lebanon) restores drylands using agroforestry systems as a socio-economic solution to empower local communities and enhance sustainable agriculture, in cooperation with the French Agroforestry Association (AFAF). Argan (Sideroxylon spinosum, South Morocco), Carob, and Olive trees are three relevant agroforestry crops that allow integrated systems and start-ups in their valorisation.

In Heading IV, ResAlliance proposes

IV.1 **Strengthen the funding** for Mediterranean cooperation research, innovation, knowledge sharing, and networking needs (PRIMA MED, Interreg MED, and Next MED, along with international non-EU cooperation, corporate responsibility and other sources of private funds…).

IV.2 **Ensure that the CAP** and related policies support the resilient management of Mediterranean landscapes, specifically, by promoting: i) maintenance of mosaic landscapes, ii) soil quality and carbon sequestration; iii) viability of extensive grazing schemes for fire prevention and biodiversity conservation; iv) conservation and restoration of landscape features[26], critical habitats and species and other NbS for climate risk prevention; v) cooperation among Mediterranean countries based on the strengths and weaknesses of the National CAP Strategic Plans.

IV.3 **Ensure long-term funding** cycles and investment in maintenance of NbS and sustainable management actions that are key to the longevity and impact of technological as well as nature-based solutions and must be structural principles of funding frameworks. Payment for Ecosystem Services (PES) can be a means to secure long-term funding.

IV.4 **Establish benchmarking conditions for financial options** on mechanisms tailored to resilience, including microcredits, debt credit, impact investment, compensation and net gain schemes, subsidies, philanthropy, transfer and monitoring mechanisms, and strategically involve insurance funds. Research, guidelines, and knowledge transfer are necessary in this area.

IV.5 **Achieve a commitment with the tourism sector**, at all scales, to provide guided 10-year management plans for climate resilience, co-created with agriculture, forestry, and nature actors in their local landscape scale, to ensure the protection of businesses and clients against Mediterranean landscape risks and disasters[27].

IV.6 **Expand** existing viable solutions for resilience through public-social-private partnerships (PSPP) and payment for ecosystem services (PES) of various types by providing promotion, support, and access to credit for these.

IV.7 **Address** the competition between agriculture and renewable energy for land resources and their returns through regulations and procedures ensuring fair and environmentally sound decisions.

IV.8 **Customize** carbon farming payments and climate credits, a particular type of PES, to Mediterranean agriculture and agroforestry. (Carbon farming and agroforestry, CAP, EU; Local carbon markets - CarboMark, Friuli Venezia Giulia and Veneto, Italy), and include connections to regenerative agriculture, ecosystem, and biodiversity payments.

IV.9 **Ensure** continued funding and dissemination of research on the effects of climate change, including drought impacts, adaptation practices, and updating of definitions of appropriate land use types specific to each territory.

IV.10 **Monitor and assess** landscape resilience financing with targeted indicators on level of funding, absorption rate, number of beneficiaries, and distribution rates, effect on rural population trends, and other.

IV.11 **Design partnerships (PSPP) inclusive of social groups**, particularly by applying an inclusive approach in partnership development towards gender-sensitive, vulnerable and less-advantaged groups who can bring in existing unique skills and potential for entrepreneurship.

Further information from ResAlliance project

- ResAlliance project (2025). **A resilient future for Mediterranean landscapes - Policy brief on the final policy forum of the ResAlliance project.** https://www.resalliance.eu/news/policy-forum-results/
- Pingault, N., Martius, C. (2024). **Resilience thinking: a brief overview.** https://www.resalliance.eu/publications/
- Pingault, N.; Martius, C. (2025) **Resilience thinking for the Mediterranean basin: How to respond to fire, drought, and flood at the landscape level.** https://www.cifor-icraf.org/knowledge/publication/9380/
- ResAlliance project (2025). **ResAlliance factsheets collection.** https://www.eufarmbook.eu/en/projects/1b68a1141da1e17bbe272408222a68a9f48cc9b8e00443c3dd1548fe06d20c9f/contributions
- ResAlliance project (2025). **A resilient future for Mediterranean landscapes - Landscape resilience blueprint for the wider Mediterranean region.** https://www.resalliance.eu/publications/

26 *Czucz, B. et al. 2022. Classification and quantification of landscape features in agricultural land across the EU. JRC, European Commission.*

27 *Examples in: Mandić, A., et al. 2025. Strengthening sustainable tourism's role in biodiversity conservation and community resilience, IUCN WCPA Issues Paper Series No. 07.*

28 *Malek, Z, et al. 2018. Effets du changement global sur la gestion des terres en région méditerranéenne. https://doi.org/10.1016/j.gloenvcha.2018.04.007*

CITATION

Borràs, M., Kalaitzidis, C., Ghosn, D., Kahale, R., Lawson, G., Maltoni, S., Plana, E., Pollicino, D., Rodríguez, C., Serra, M., Stiti, B., Xanthopoulos, G. (2025). *A resilient future for Mediterranean landscapes – White paper on policy recommendations for landscape resilience in the Mediterranean region*. Pau Costa Foundation, CIHEAM-MAICh, Jouzour Loubnan Association, EURAF, FoReSTAS, CTFC, IUCN, European Forest Institute, INRGREF, and ELGO-DIMITRA. https://www.resalliance.eu/publications/

LEAD AUTHORS

Mariona Borràs (coord.)[1], Chariton Kalaitzidis[2], Dany Ghosn[2], Rhea Kahale[3], Gerry Lawson[4], Eduard Plana[5], Marta Serra[5], Dario Pollicino[6], Carmen Rodríguez Fernández-Blanco[7]; Eduard Mauri[7], Boutheina Stiti[8], Gavriil Xanthopoulos[9].

CONTRIBUTING AUTHORS

Jordi Pietx[1], Stefanos Tsiaras[9], Joana Paulo[10], Paulo Firmino[10], Sandra Bohne[11], Nathanael Pingault[11].

AFFILIATIONS

1 Pau Costa Foundation (PCF)
2 Mediterranean Agronomic Institute of Chania (CIHEAM-MAICh)
3 Jouzour Loubnan Association (JL)
4 Fédération Européenne d'Agroforesterie (EURAF)
5 Centre de Ciència i Tecnologia Forestal de Catalunya (CTFC)
6 Union Internationale pour la Conservation de la Nature et de ses Ressources (IUCN)
7 European Forest Institute (EFI)
8 Institut National de Recherches en Génie Rural, Eaux et Forêts (INRGREF)
9 Institute of Mediterranean Forest Ecosystems (IMFE), Ellinikos Georgikos Organismos DIMITRA (ELGO-DIMITRA)
10 Instituto Superior de Agronomia (ISA)
11 Center for International Forestry Research (CIFOR)

LAYOUT

BuxumLunic
www.buxumlunic.ch

DISCLAIMER

Views and opinions expressed are those of the authors only and do not necessarily reflect those of the European Commission or the State Secretariat for Education, Research and Innovation of Switzerland. Neither the European Commission, the State Secretariat for Education, Research and Innovation of Switzerland, nor the granting authority can be held responsible for them.

This publication was funded through the ResAlliance project.

"Landscape resilience knowledge alliance for agriculture and forestry in the Mediterranean basin" (ResAlliance) received funding from the European Commission's Horizon Europe programme under grant agreement Nº 101086600, and from the State Secretariat for Education, Research and Innovation of Switzerland.

Co-funded by the European Union

Co-funded by
the European Union

Co-funded by State Secretariat for Education, Research and Innovation of Switzerland

Schweizerische Eidgenossenschaft
Confédération suisse
Confederazione Svizzera
Confederaziun svizra

COORDINATED BY

EFI

IN PARTNERSHIP WITH

ETIFO valuing nati
European University Cyprus
CIFOR
World Agroforestry
CIHEAM CHANIA
CTFC
D.R.E.AM. ITALIA
INRGREF
ELGO - DIMITRA HELLENIC AGRICULTURAL ORGANIZATION - DIMITRA
EURAF European Agroforestry Federation
Forestas Agenzia forestale regionale pro s'sviluppu de su territoriu e de s'ambiente de sa Sardigna Agenzia forestale regionale per lo sviluppo del territorio e dell'ambiente della Sardegna
REGIONE AUTÒNOMA DE SARDIGNA REGIONE AUTONOMA DELLA SARDEGNA
SardegnaForeste
INSTITUTO SUPERIOR D AGRONOMIA Universidade de Lisboa
IUCN
جذور لبنان jouzourloubnan.org
IRTA RECERCA I TECNOLOGIA AGROALIMENTARIES
PAU COSTA FOUNDATION

EFIMED@EFI.INT
INFO@PAUCOSTAFOUNDATION.ORG
WWW.RESALLIANCE.EU