DEMONSTRATION AND MODELLING OF NATURE-BASED SOLUTIONS TO ENHANCE THE RESILIENCE OF MEDITERRANEAN AGRO-SILVO-PASTORAL ECOSYSTEMS AND LANDSCAPES: DRYAD PROJECT

DRYAD

Encuentro Nacional POR LA SALUD DEL SUELO

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INTRODUCTION

- Mediterranean agro-silvo-pastoral ecosystems (MAEs), provide essential environmental services and influence significantly local communities and their economies.
- MAEs are expected to be severely affected by climate impacts and extreme conditions such as droughts, high tree mortality and wildfires.
- The DRYAD project contributes to the Mission Adaptation to Climate Change by developing and implementing real-life, climate-resilient nature-based solutions (NBS) for MAEs.
- DRYAD combines front-line scientific, technological, social, and business innovations as well as transformative solutions.
- The proposal will be centered around development, testing and demonstrating NBSs in 5 demonstration regions and will be transferred to 3 replicating regions.
- DRYAD will support a multi-level and cross- sectoral integrated and adaptive management governance via development of Decision Support Systems.

MAEs CHALLENGES

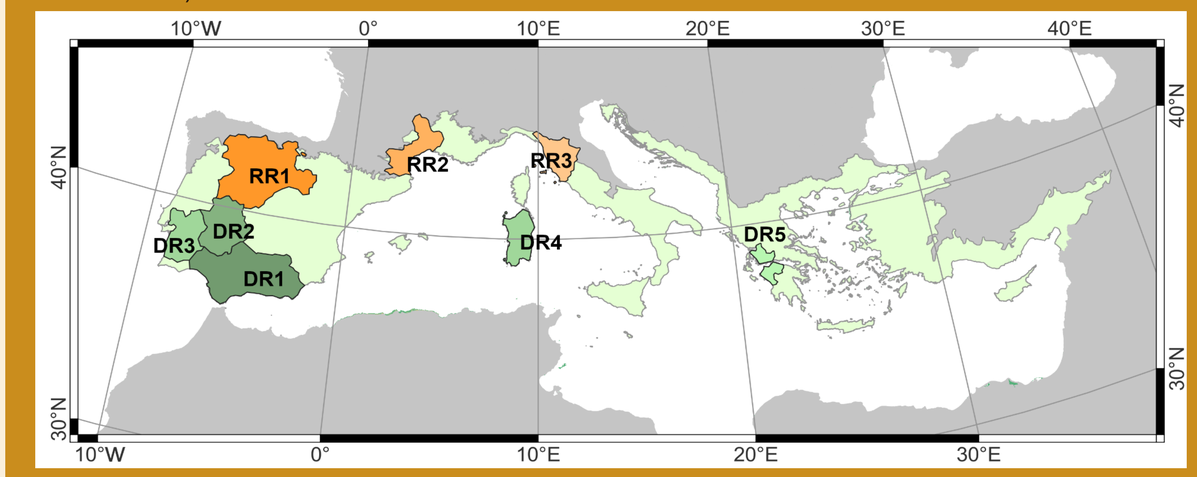
- Climate change-related: more intense rainfall, with larger spatio-temporal variability.
- Expanding droughts decline water availability, especially groundwater availability and lower water table and reduce river baseflow.
- Oak tree mortality, shrub encroachment, soil degradation and decrease of pasture quality, result in systematically reduced production.
- Wildfires.

DRYAD OBJECTIVES

- Developing and testing novel scientific tools and models to enhance the resilience of the Mediterranean agroforestry sector.
- Developing and demonstrating evidence-based, science-proofed and community tailored methodologies and management of NBS approaches in Pilot Demonstration Areas (PDAs) and their replications in Pilot Replication Areas (PRAs), focussing on increase of MAE resilience to climate change and adaptation to mitigate multi-risk conditions.
- Upscaling of PDAs and PRAs into Demonstration Regions (DRs) and Replication Regions (RRs).
- Dissemination of modern technologies and management approaches through Multistakeholder Engagement.

DEMOSTRATION REGIONS (DRs) AND REPLICATION REGIONS (RRs)

- DR1 – Cardena, Pozoblanco, Hinojosa, Vilaviciosa (Andalusia, Spain)
- DR2 – Majadas, (Extremadura, Spain)
- DR3 – Lezirias, Villa Vicosa (Alentejo, Portugal)
- DR4 – Tirso, (Sardinia, Italy)
- DR5 – Xiromero, (Aetoloakarnania, Greece)
- RR1 – Sardon (Castilla-Leon, Spain)
- RR2 – Pays des Cevennes (Occitanie, France)
- RR3 – Colline Metallifere (Tuscany, Italy)



Majadas (Extremadura, Spain)

Santa Clotilde (Andalusia, Spain)

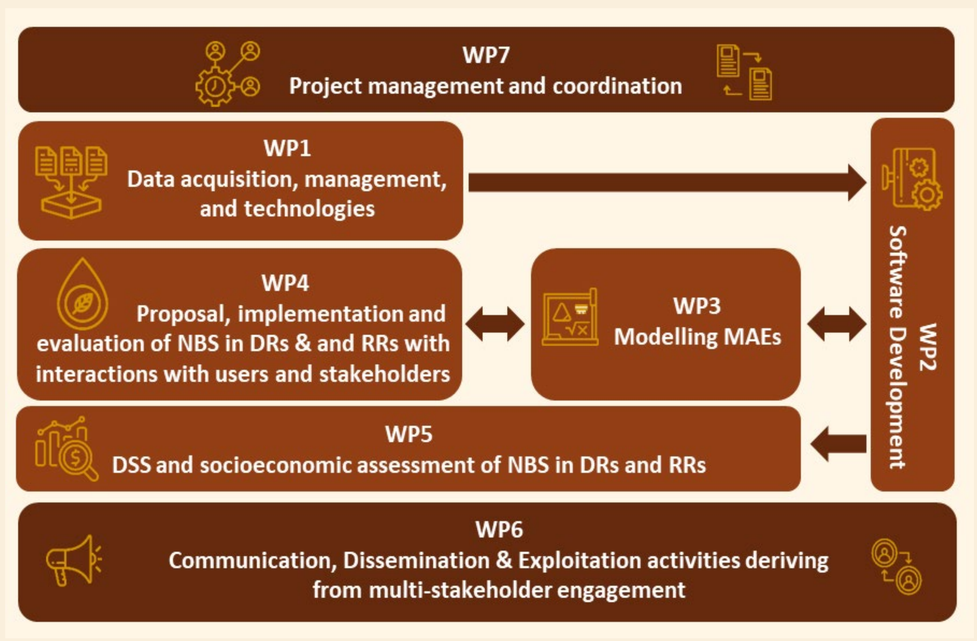
Sardon (Castilla-Leon, Spain)

Eddy Covariance Santa Clotilde (Andalusia, Spain)

Santa Clotilde (Andalusia, Spain)

Tree Talker Hinojosa (Andalusia, Spain)

DRYAD IMPLEMENTATION – WORK PACKAGES



Dehesa, Santa Clotilde (Andalusia, Spain)

Stakeholder engagement

PROPOSED NATURE-BASED SOLUTIONS (NBS)

Primary Objective	NBS ID	NBS name	Description	Type NBS
Rainwater harvesting (Reinforce Water Infiltration)	1	Key line	Deep digging of contour lines every 10-20 m in the cropland and grassland slopes	Intervention
	2	Ditches	Excavated along contour lines, filled with vegetation residues from tree pruning and grass cutting	Intervention
Rainwater Storage	3	Dry detention ponds, leaky dam systems, and infiltration swales	Network of water channeling and storage infrastructure to increase the water availability for livestock	Intervention
Assessing risk of tree mortality in terms of vulnerability to drought	4	Early detection of vulnerability to drought	In-situ assessment of tree health status and mortality by using specific tree sensors, process-based ecophysiological models, composite risk indexes, and EO recurrence indexes.	Process
Securing water availability for livestock; Conservation areas for biodiversity improvement	5	Artificial ponds (*charcas*)	The selected ponds should have sufficient contact with the aquifer to ensure permanent water availability.	Intervention
Water availability for plants (Soil Water Holding Capacity)	6	Biochar	Pruning waste will be chaired and used to gain soil organic carbon and strengthen soil water holding capacity	Action
	7	Planting trees and shrubs in croplands and grasslands	Scattered clusters of trees and shrubs in open fields increase noticeably the content of soil organic carbon and have positive effects in multi-scalar water cycle	Action
	8	Protection of tree regeneration on grasslands	Reconciling livestock grazing with tree protection through tree shelters and temporary fences	Action
Soil Health	9	Adaptive management of grazing activities	Adaptive grazing practices will also be promoted to further enhance soil health.	Process
Wildfire prevention	10	Fuel management in fire-prone areas	Thinning, pruning and grazing to reduce fuel load	Process/Action
Avoid overgrazing	11	Real-time livestock monitoring	Radio-collars will be used to track the livestock	Process
Biodiversity conservation	12	Natural islands	The creation and maintenance of natural islands of diverse nature (shrubs, ponds, wet areas, tree lines, stone wall …) as refuges for increasing biodiversity.	Action/Process
	13	Wetlands	Restore natural water courses, water bodies, riparian zones and their connectivity	Action/Process
Ecosystem restoration, forest regeneration and recovery	14	Promote and/or facilitate natural processes of ecosystem restoration,	Conservation and favouring secondary succession processes, reforestation using native or naturalised tree and shrub species, protection of stands through mechanical barriers, biological improvement of the soil, calcium fertilisation, and reforestation in areas not colonised by Phytophthora.	Action/Process

NBS – Key lines

NBS - Ponds

https://dryad-project.eu/