



Desert-Adapt

Life

DESERT-ADAPT

**Preparing desertification
areas for increased
climate change**

LAYMAN'S REPORT

Restore Nature, Change to Adapt



LIFE16 CCA/IT/000011

This project has received funding from the LIFE programme of the European Union

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The contents of this publication are the sole responsibility of the Desert-Adapt LIFE consortium and do not necessarily reflect the opinion of the European Union

Desert-Adapt LIFE project at a glance

DETAILS OF THE PROJECT

Number: LIFE16 CCA/IT/000011

Location: Italy, Spain, Portugal

Budget: 4,075 M euro

% EC co-funding: 2,439 M euro

Duration: 01/09/2017 - 01/09/2023

Partners: 19 (9 technical, 10 landowners)

THE LIFE PROGRAMME

The LIFE Programme is the EU's funding instrument for the environment and climate action.

Climate Change Mitigation and Adaptation sub-programme

Contributes to the shift towards a sustainable, energy-efficient, renewable energy-based, climate-neutral and resilient economy, thereby contributing to sustainable development.

PROJECT PARTNERS

Coordinating beneficiary

Università degli studi della campania Luigi Vanvitelli (IT)

Associate partners

Forestry Service Group BV (NL)

Associação de Defesa do Património de Mértola (PT)

Universidade de Extremadura (SP)

Università degli Studi di Palermo (IT)

Faculdade de Ciências da Universidade de Lisboa (PT)

TerraSIG Lda. (PT)

Nova Faculdade de Ciências Sociais e Humanas Universidade Nova de Lisboa

Município de Serpa (PT)

L1 Lamp. Municipality of Lampedusa e Linosa (IT)

L2-L11 A&T. Ambiente & Territorio Srls (IT)

L3 SAFT. Società Agricola Franco Turco (IT)

L4 CSL. Consorzio Siciliano LEGALLINEFELICI (IT)

L5 Hoyos. Ayuntamiento de Hoyos (SP)

L6 VdFres. Ayuntamiento de Valverde del Fresno (SP)

L7 Gam. Viveros Forestalis La Dehesa SL (SP)

L8 Cab Gor. Freguesia de CABEÇA GORDA (PT)

L9 Madeira. Sociedade Agrícola Vargas Madeira, Lda (PT)

L10. Sobreira. Sociedade Agrícola da Sobreira, Lda (PT)



Desertification risk and climate change

“The Mediterranean is the most susceptible region in Europe to soil degradation and desertification”

“Due to human-created pressures and global warming, many areas in Europe's Mediterranean region are reaching critical limits for their ability to provide ecosystem services”

“In EU 33% of soils are degraded and 90% might be by 2050

The cost of soil degradation for the sole EU is in the order of billions of euro per year”

In a scenario of increasing climatic pressure **ADAPTATION** and **SUSTAINABLE** land managements are the only answers to allow productive system to recover ecosystem services functional to ecosystem health, productivity and resilience to the progressively increasing climate stress.



Desert-Adapt LIFE mission

of public and private landowners



Contribute to the fight against Climate Change and Land Degradation



Embrace the responsibility to protect the land by using adaptive strategies to ensure a safer planet for present and future generations

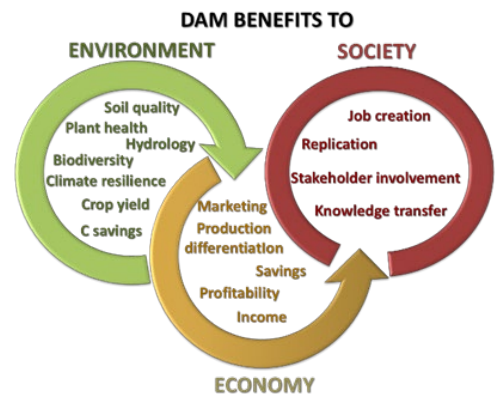


Seek long-term land sustainability, economic self-sufficiency and social balance valorising nature-based solutions and natural capital

Desert-Adapt LIFE goal

Desert-adapt aims to demonstrate adaptive strategies of land management specifically designed to counter aridification and land desertification in in Mediterranean areas under desertification risk.

The land management model we define “**Desertification Adaptation Model**” (DAM)” is an integrated ecosystem approach which combines targets and measures of environmental sustainability and climate change adaptation with actions aimed to improve socio-economic conditions.



Desert-Adapt LIFE specific objectives

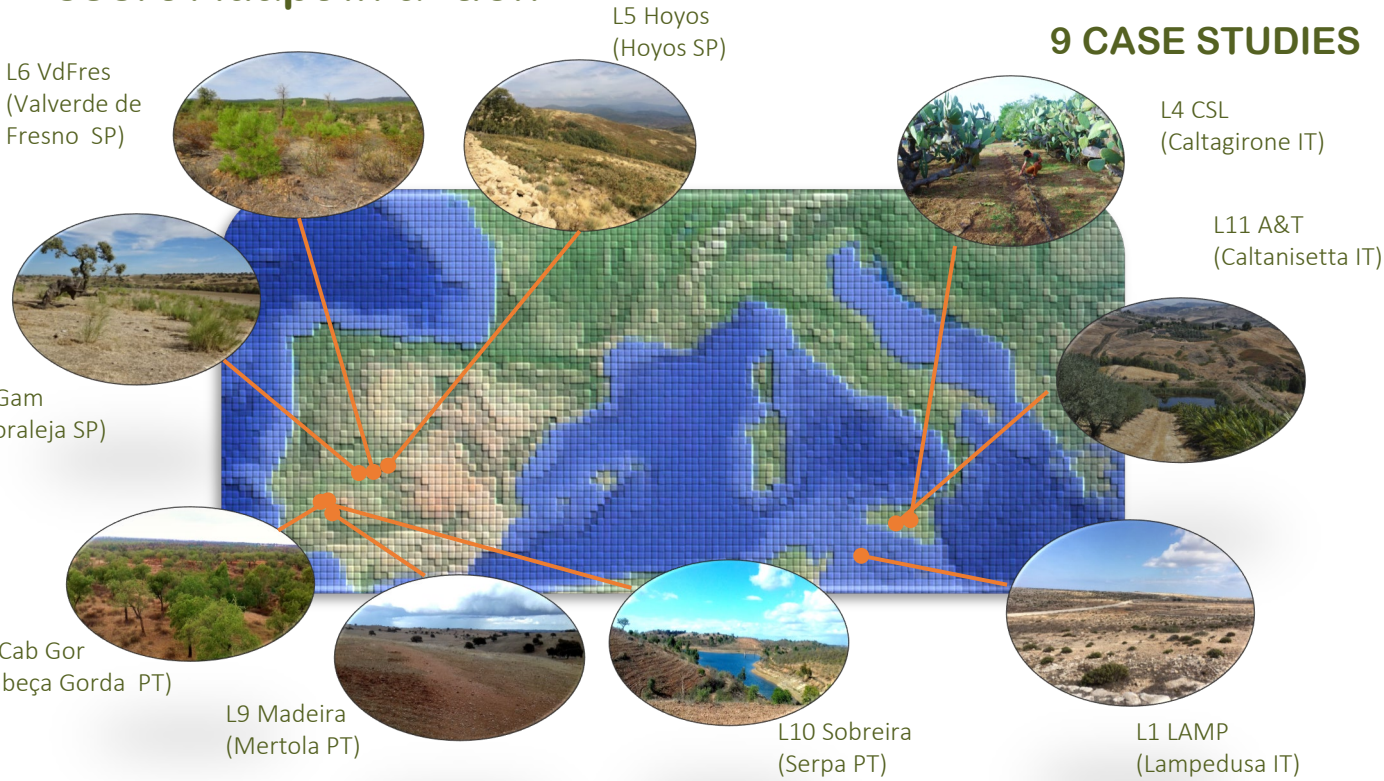
Objective one: to test the positive effects of 9 DAM case studies representative of three regional areas of Mediterranean EU at desertification risk.

Objective two: promoting DAM system among a variety of stakeholders seeking socioeconomic opportunities from climate resilient and profitable land use.



Desert-Adapt in action

9 CASE STUDIES



9 Desertification Adaptation Models created

The 9 landowners, 4 municipalities and 5 private farming companies have co-created together with the technical staff 9 DAM plans covering a total of 1016,18 hectares



Desert-Adapt in action

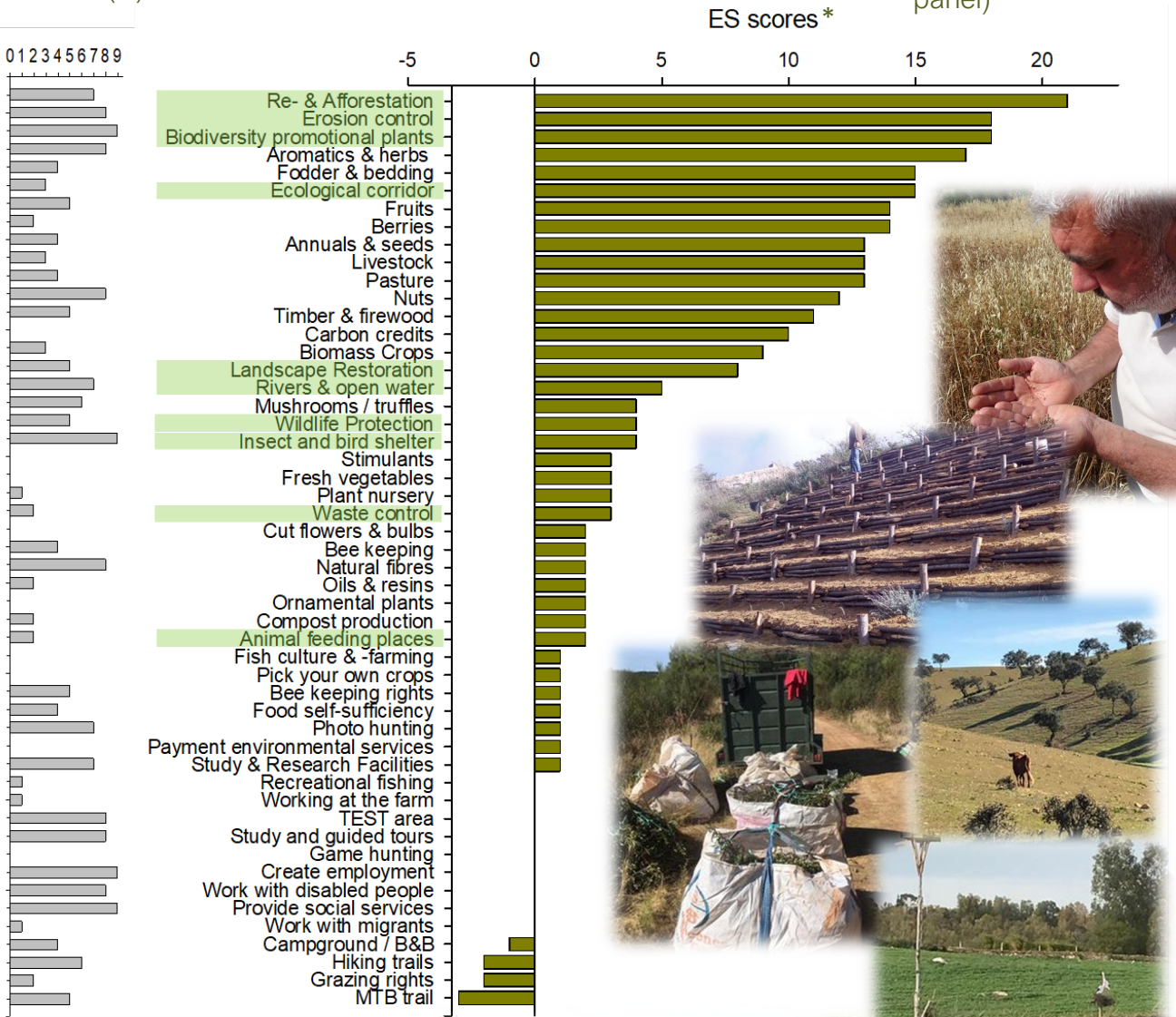
DAM implementation in the field

Land functions (51)

Economic (37)

Ecological (11)

Social (3)



Functions

Ecosystem Service score

In grey scale n° of landowners (out of 9) who chose the specific function on the right panel)



*ES score of each function is the sum of positive (+1), neutral (0) and/or negative (-1) effects of the function on the 24 ecosystem services evaluated in the project

Desert-Adapt in action

DAM implementation in the field

53 Adaptation measures implemented related to

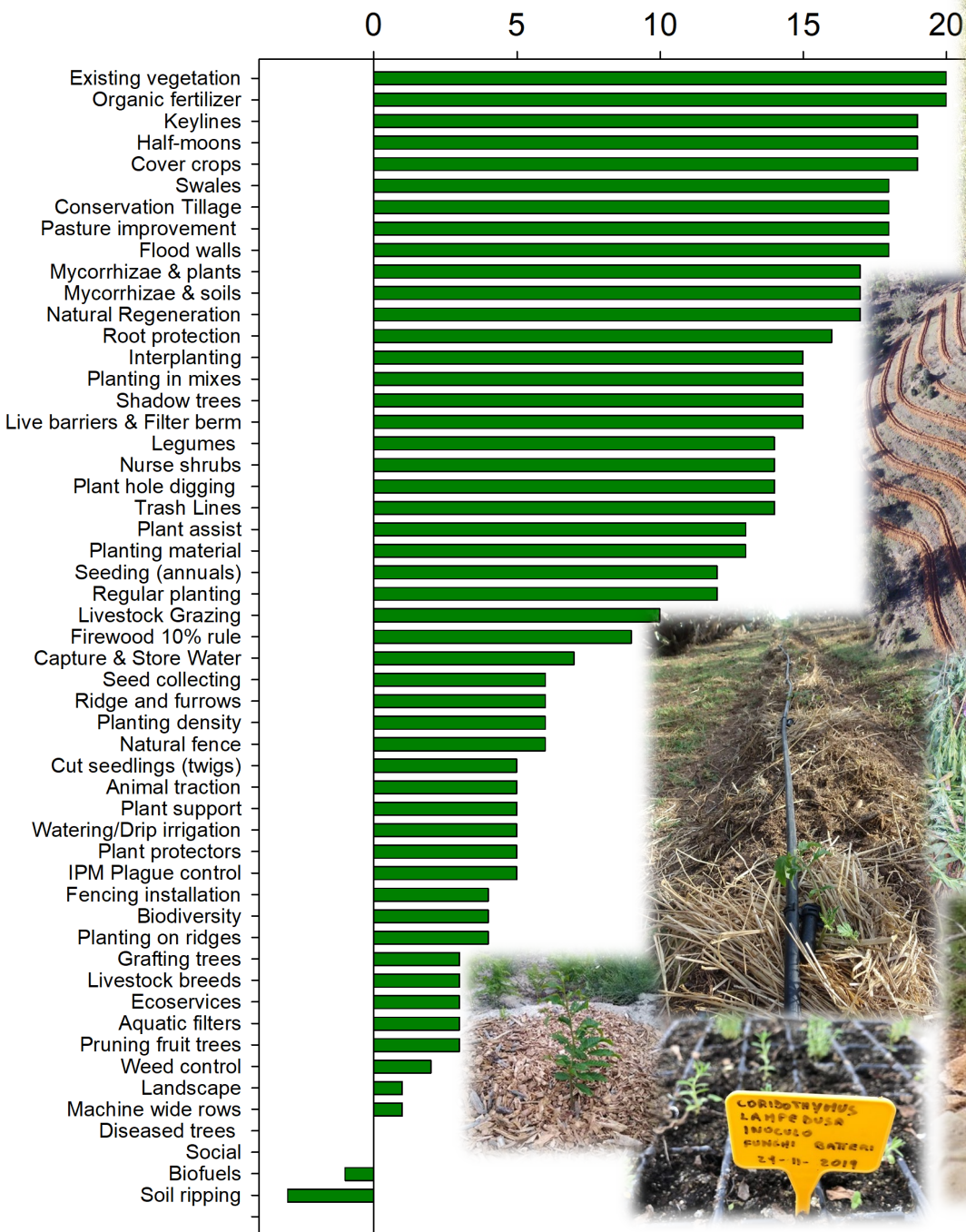
- Soil management
- Plant management
- Landscape
- Hydrology
- Livestock
- C sequestration

Adaptation measures

Ecosystem Service score



Adaptation Measures ES score*



*ES score of each measure is the sum of positive (+1), neutral (0) and/or negative (-1) effects of the measure on the 24 ecosystem services evaluated in the project

Desert-Adapt **SCIENCE** in action

In order to validate the effectiveness of the adopted measures on the amelioration of ecosystem services and cost/benefit analyses, Desert-Adapt identified characterized and monitored:

- 24 key project indicators (KPI) for the environmental amelioration of ecosystem services and natural capital
- 7 KPI for economic performance and replicability

BASELINE CHARACTERIZATION CAMPAIGN IN 2018

CONTINUOUS MONITORING AND CAMPAIGNS IN 2022-23



8 technical partner teams, more than 30 experts, to evaluate project KPIs in 16 areas of impact

Ecology
Botany
Microbiology
Forestry
Agronomy
Zoology
Ornithology
Entomology

Business
Marketing
Social science

Land
Owners
Producers

Soil science
Hydrology
Geography
Cartography
Climatology
Drones

V: Università degli Studi della Campania Luigi Vanvitelli



UNIVERSITÀ
DEGLI STUDI
DI PALERMO



Desert-Adapt in number

RESULTS

LAND AND ENVIRONMENT



Improved land

1016,18 ha covered by DAMs
Planted 93.391 trees, shrubs and plants in 132 species



C sink

C sequestered in the vegetation: 2,1 Tons CO₂/ha/yr



GHG Reduction

Around and 180 Ton CO₂ sequestered in total on average per year with newly planted trees

Desertification risk



Reduction of 1 ESA class (Environmentally Sensitive Area to desertification) over areas of intervention



Soil water resource

2-3% increase of soil water retention capacity

34-66% avoided soil run-off by improved land use

3 folds reduction of plant mortality rates by use of plant growing aids



Soil quality

52-67% increase of soil C, 53-77% of soil N under adaptation measures

49-59 % increase of aggregate stability under adaptation measures

36-47% increase of nutrient retention (CEC) under adaptation measures



Biodiversity

Taxa

Species

Indicators

Functions

6-18 % increase (frequency -intensity) of mychorrizal root colonization

Indicator species: +30% more bird species; +29% soil fauna taxa; + 15% QBS, no variations of butterfly Shannon index and 2% variation for Bees shannon index, while no increase in taxa.

>30% in soil microbial biodiversity, biomass and functionality



Desert-Adapt in number

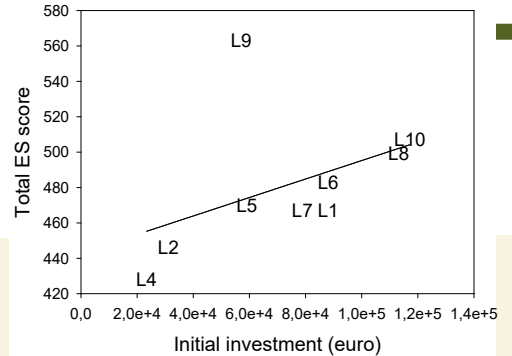
RESULTS

Generated project indicators

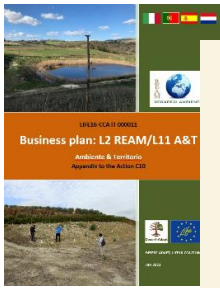
6 partners with positive balance have
Internal Return Rate up to 22% increase
Potential revenues (in 12 yrs) up to 209 €/ha

Cost/benefit analysis of initial investment (€) for chosen functions and measures vs. estimated score of ecosystem services (ES score) reported for each partner.

Socio-economic outputs



9 Business plans (1 for landowner) integrating



Economic model of the DAM

- Cost & income for each of the 120 functions
- Final balance of complete DAM
- Internal Rate of Return (IRR)
- Capital employed & initial investment
- Payback year

Branding package



Commercial Plans

for 11 products, extra to the business as usual production, from economic functions introduced in the DAMs



Desert-Adapt in number

RESULTS

REPLICATION

Dissemination by **REPLICATION** of **good practices** for the fight against climate change, land degradation and desertification risk is a strategic objective of the Desert-Adapt project.

The project has created a tool kit to support stakeholders in creating their own sustainable land management plan (DAM Model). Our partners (landowners have open their farms to share their knowledge and experience with new friends in a beneficial reciprocal flow of knowledge. The final aim is to create **RESILIENT COMMUNITIES** based on sustainable and adaptive common goals and strategies.

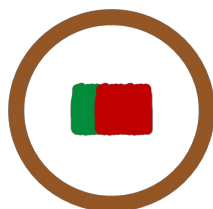
WHO CAN BE A REPLICATOR? public bodies, companies, organizations, citizens, who manage portions of the land and who care for the sustainability of their land and share our vision, as reported in the [Desert Adapt MANIFESTO](#).

The tool kit can be downloaded from to the project webpage

DESERT-ADAPT REPLICATORS

involved during the project

	N° of replicators			
		14	36	35
	Hectares of replication	87.8	5.669.7	4793.8



Click to explore our replicators or go to the project website www.desert-adapt.it

Desert-Adapt in number

Dissemination Communication & networking

OUTREACH

>450,000 Cumulated impressions on social media and web page

63 News and interviews on media, TV, radio **>100,000 views**

17 Informative videos } **>37,000 views**

17 DRONE flight video }

1 Replication toolkit

9 Stakeholder meetings **81 attendees**

45 Open days and outreach events with farmers and policy makers including final conference **3718 involved**

33 Networking activities with LIFE and other projects and stakeholders

1113 Students involved in activities

27 Presentation to national and international congresses **>4000 involved**

4 ISI scientific publications of project results

15 Open training courses **365 attendees**



Desert-Adapt long-term environmental benefits

Contribution to EU and international environmental objectives

Desert-Adapt sites are expected to increase, over the 11.000 ha of partners and replicators, C sequestration, to reduce soil erosion and to increase ecosystems services, contributing to the EU targets of climate neutrality 2050, to the EU biodiversity strategy, to SDGs 2030 targets and to the nature restoration law. The actions are also in line with the expected engagement of farmers to the Farm to Fork strategy objectives of sustainability of the food system.

Increased climate resilience

The proposed adaptive management strategies provide a clear roadmap for landowners to increase their resilience to the increasing climate change, reducing desertification risk as well as economic and social risks.

Best Practice lessons and Spin-off effect

The demonstration value of the proposed best practices is expected to spin off in the coming years more actions from the partners (more intensive and extensive engagement) which can spill over to neighbours and connected stakeholders.

Policy implications and recommendations

Adaptation

Climatic extremes beyond expectation

Need to increase adaptation measures adoption & strategies / fire management plans / water collection

Lack of awareness and knowledge

More dissemination / communication & education measures needed on the topic

Lack of technical dedicated staff for sustainable management planning

Need for consortia with centralized offices providing sustainability services with skilled technical personnel

Economic sustainability

Costs of measures not covered by subsidies

Need to identify more relevant adaptation measures to be financed at local / regional level

More diffused support to farmers for access to and implementation of financed measures

Strong competition for manpower and water on smaller farmers from big agro-companies

Consortia forms and dedicated infrastructures are needed

Policy gaps

Lack of a supporting sustainability network for farmers / municipalities

Initiative to support the creation of networks

Complex bureaucracy for plans in public areas

Support / simplification

Conflicts with other EU frameworks (PAC, Natura 2000)

Disentangle real "ecological / adaptation" priorities and synergies in the most climate exposed areas, adaptation and socio-economic sustainability in tandem with environment sustainability



Desert-Adapt

Restore Nature, Change to Adapt



VISIT OUR WEBSITE
www.desert-adapt.it



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LIFE Desert-Adapt



LIFE16 CCA/IT/000011
A co-funded project by the
LIFE Program of the European
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