Desert-Adapt
Restore Nature, Change to Adapt

After Life Plan
DESERT-ADAPT PROJECT
LIFE16 CCA/IT/000011
2023-2028

TABLE OF CONTENT

PROJECT OVERVIEW

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)

PROJECT PARTNERS

Coordinating beneficiary
Università degli studi della Campania Luigi Vanvitelli (IT) - SUN

Associate beneficiaries
Forestry Service Group BV (NL) - FSG
Associaçao de Defesa do Patrimonio de Mértola (PT) - ADPM
Universidad de Extremadura (SP) - UNEX
Università degli Studi di Palermo (IT) - UNIPA
Faculdade de Ciencias da Universidade de Lisboa (PT) - FCUL
TerraSIG Lda. (PT) - TerraDro
Nova Faculdade de Ciências Sociais e Humanas Universidade Nova de Lisboa – Nova FCSH
Município de Serpa (PT) - SERPA
L1 Municipality of Lampedusa e Linosa (IT) - LAMP
L2-L11 Ambiente & Territorio Srls (IT) - A&T
L3 Societa Agricola Franco Turco (IT) - SAFT
L4 Consorzio Siciliano LEGALLINEFELICI (IT) - CSL
L5 Ayuntamiento de Hoyos (SP) - HOYOS
L6 Ayuntamiento de Valverde del Fresno (SP) - VDFRES
L7 Viveros Forestalis La Dehesa SL (SP) - GAM
L8 Freguesia de CABEÇA GORDA (PT) – CAB GOR
L9 Sociedade Agrícola Vargas Madeira, Lda (PT) - MADEIRA
L10 Sociedade Agrícola da Sobreira, Lda (PT) - Sobreira

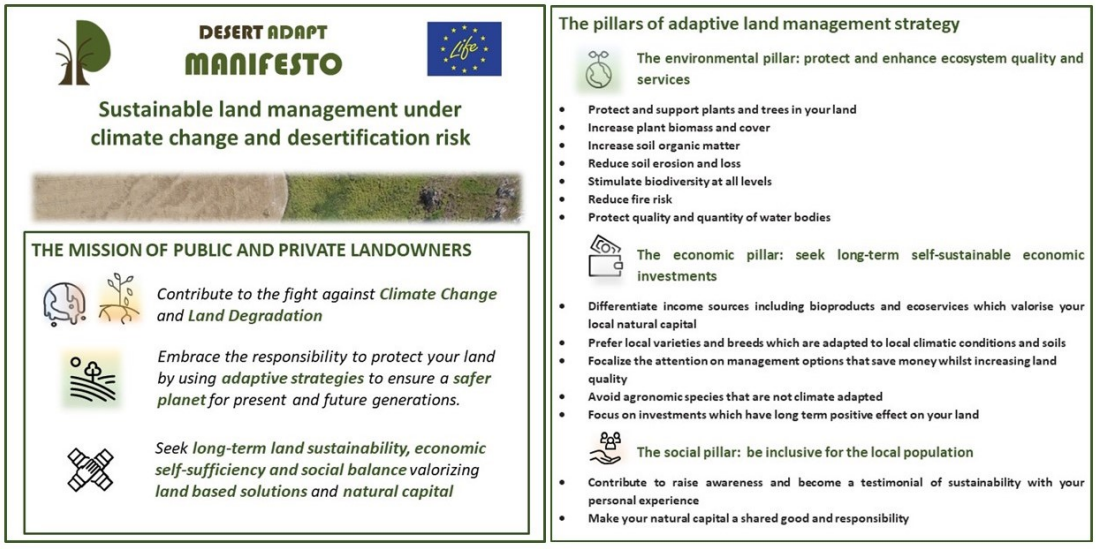
DESERT-ADAPT OVERARCHING GOAL

The climate change is considered as one of the greatest global challenges humanity is facing today, causing at present multiple negative effects at planetary scale, which are expected to exacerbate in the coming decades (IPCC 2022). Such effects include, in many areas of the globe, a significant further increase of average atmospheric temperature and decrease of rainfall, like in the Mediterranean area (IPCC 2022). This trend, in combination with anthropic pressures related to agriculture, is leading very fast to land degradation and desertification risk in many areas of Europe (Gabriele et al., 2022). Within the Mediterranean area, Italy, Spain and Portugal are experiencing alarming increasing rates of land degradation, soil erosion and nutrients loss (Eekhout et al., 2018; Cantón et al., 2011; Seager et al., 2007; Burke et al., 2011). This loss of ecosystem service and quality can lead to irreversible ecosystem degradation and to economic and social crises. Hence strong and timely adaptation strategies of land management are required and need to be put in place with stakeholders and landowners. Adaptation consists of strategies which minimize vulnerability to climate change and desertification. Adaptation is closely linked to the preservation, recovery and enhancement of natural capital, biodiversity and ecosystem services (MEA, 2005). It is also strongly linked to climate mitigation and C farming as it is strongly based on the recovery of naturality, vegetation cover, soil carbon improvement, which overall contribute to increase the resilience of the system.

Desert-adapt overarching goal is to test adaptive strategies of land management specifically designed to counter aridification and land desertification in Mediterranean areas under desertification risk

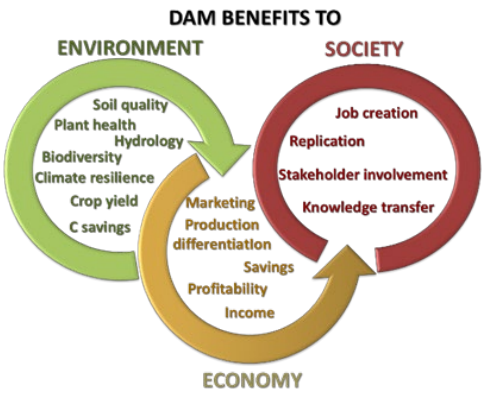
Specific Objectives

1. Demonstrating innovative adaptation technologies, i.e. desertification Adaptation Models', in 3 E.U. regions already affected by climate change, developed for site-specific conditions and opportunities, contributing to improved socio-economic development and benefits for biodiversity and environment.
2. Promoting and replicating the DAM framework method among a variety of stakeholders, including local farmers seeking socio-economic opportunities from climate resilient and profitable land use, and among policymakers, to enable replication and upscaling beyond project study areas and duration.



DESERT-ADAPT METHODOLOGY

THE DESERTIFICATION ADAPTATION MODEL (DAM)



The **"Desertification Adaptation Model" (DAM)"** is an integrated land management framework that combines targets and measures of environmental sustainability and climate change adaptation with actions aimed to improve socio-economic conditions, designed to respond to the *need to adapt to current Climate Change* and the *need to reduce and counteracts* the increasing phenomenon of *land degradation and desertification risk*.

DAM is based on 3 PILLARS OF SUSTAINABLE LAND MANAGMENT

The Economic pillar: long term land protection needs to be economically profitable to be self-sustainable. The most appropriate areas of a land property could be assigned to agro-productions and eco-services, that provide economic income based on natural capital, diversifying income sources, choosing agro-productions which are best adapted to the local climate and avoiding intensive agriculture practices.

The Environmental pillar: the DAM land management plan should look like a mosaic, where crops or productive areas are alternated to more natural areas, where ecosystem quality and biodiversity are restored and nurtured to provide key ecosystem services for the whole area and measures are put in place in productive areas to recover and increase the ecosystem service quality.

The Social pillar: the land management plan should be inclusive for the local population, good actions should be communicated and, especially in municipalities, citizens should be involved into land protection and land use activities so to provide a feeling of collective efficacy and common responsibility.

For each one of the 3 pillars landowners associate a set of *functions* to their land surface

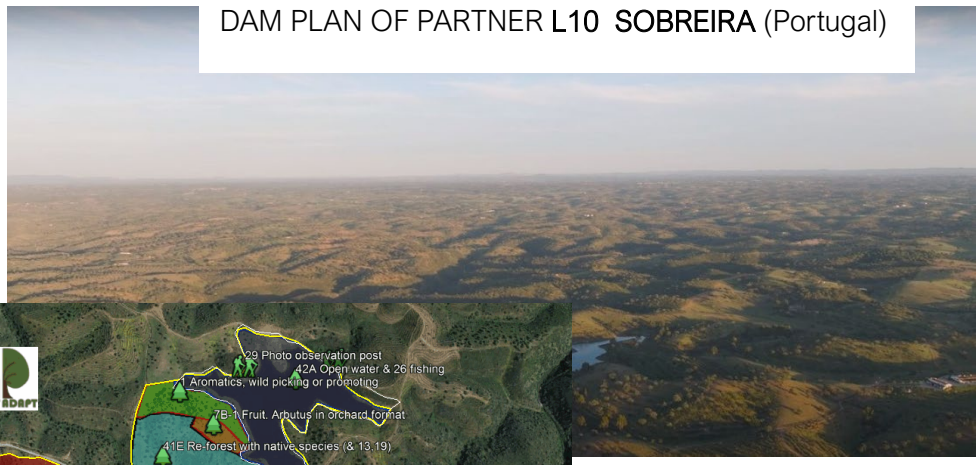
By function we mean the purpose or use of a specific area of land

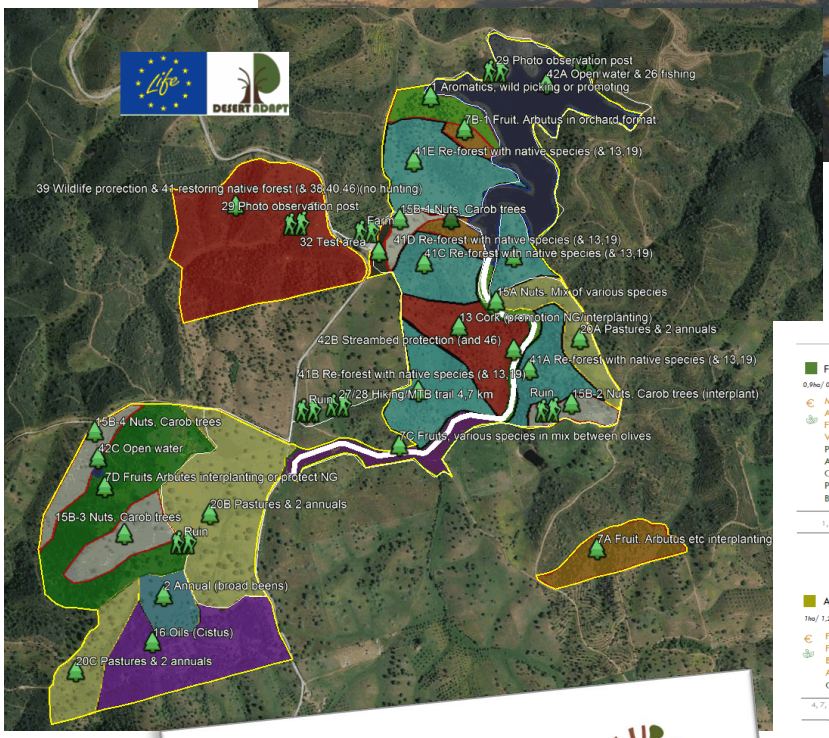
Additionally, for each function, landowners assign a certain number of *adaptation measures*, *i.e actions to implement in the field the chosen functions maximizing land protection and sustainability.*

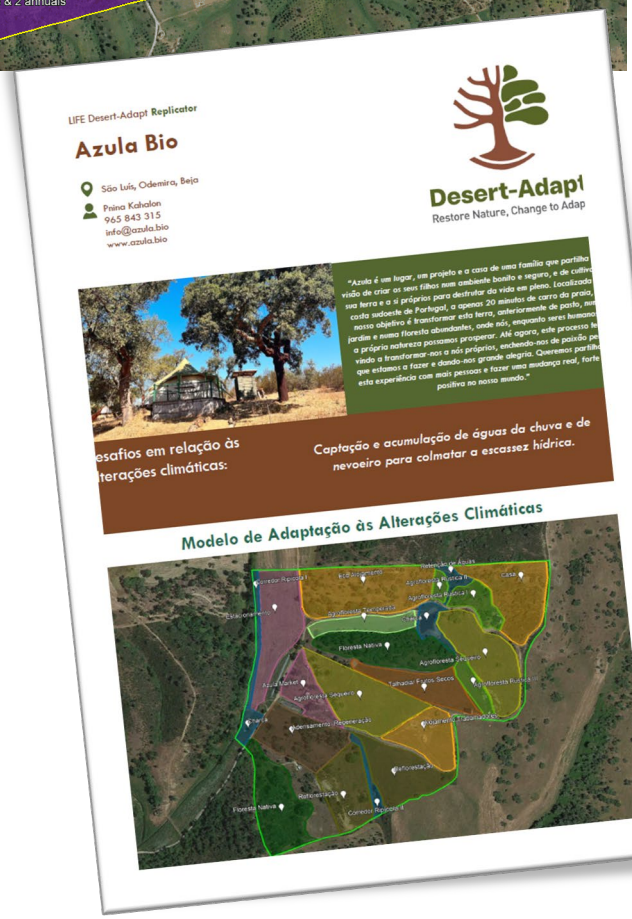
The **Adaptation Measures** are a key element of the DAM plan. They represent the management operations or actions to be taken in the field in order to optimize plant survival and productivity, to protect ecosystem quality, to enhanced ecosystem services on the long term, hence reducing degradation and desertification risk.

Particular attention should be posed to a preliminary risk analysis that can lead the DAM plan towards specific choices aimed at in particular at limiting fire risks.

DAM PLAN OF PARTNER **L10 SOBREIRA** (Portugal)







PROJECT ACTIONS

SCOPING PROJECT SITES, STAKEHOLDER ANALYSIS AND CONSULTATION

A preliminary evaluation of the socio-economic, cultural, environmental context and barriers of the study area, needs and opportunities on which DAM actions can be built, was done at start with local partners and local stakeholders.

ESTABLISHING THE PROJECT BASELINE

The baseline values of project key indicators were evaluated in 10 areas belonging to landowners, partner of the project, in IT, PT and SP (almost 1000 hectares) in 2018 throughout dedicated campaigns, field and laboratory analyses. KPIs covered soil quality, hydrogeology, plant biomass, plant mycorrhization, biodiversity of soil, plants, insects, and birds, land mapping by drones, climatic projections, desertification risk characterization, evaluation of socio-economic indicators.

TRAINING: LANDOWNERS, PARTNERS, PERSONNEL AND OTHER STAKEHOLDERS

Knowledge is the basis of actionability. Desert-Adapt provided *15 short courses* on topics related to key issues faced by farmers, landowners, municipalities, citizens in the areas of intervention. The courses spanned from climate change to ecosystems services, soil quality, desertification, adaptation measures, biodiversity and more. They were held by expert from the project team, in the three implementation countries IT, SP and PT and involved almost *400 persons*. Formations and knowledge transfer remains at the core of the actions needed to support large scale adoption of adaptation strategies in the Mediterranean area.

DESERTIFICATION ADAPTATION MODEL (DAM) DESIGN AND ITERATIVE IMPLEMENTATION

Nine Desertification adaptation models were co-created during dedicated sessions that brought together landowners and technical experts.

The creation of DAMs is a dynamic process, as it depends on many dynamic factors, such as climate, nature and also the international and national markets, as well as societal issues. For this reason, the DAMs were meant to be progressively implemented and revised throughout the years of project, to "adapt" the land management to the ongoing conditions to optimize the cost/benefit of the implementation both environmentally and economically. For this reason, an economic plan was also associated to each DAM to estimate the true costs of implementation and "in progress" land management vs. potential economic gains on the short-medium-long term, analysing the return time of initial investments for each applied function or measure.

VALORIZING THE ECONOMIC FUNCTIONS AND IMPROVED ECOSYSTEM SERVICES

Desert-Adapt aimed at the economic valorization of DAM plans by evaluating the marketability of new products and services introduced with DAM, setting up materials for branding and marketing to support the future introduction of these products in the market and the sustainability engagement of partners as a competitive “plus” for the market.

EVALUATING THE ENVIRONMENTAL AND SOCIO-ECONOMIC IMPACTS OF DAM

Crucial for the success of the project and for a convincing replication activity was the demonstration that the actions set in place on the land produced positive results. These are fundamental to increase the trust of both landowner partners and potential replicators.

The project set a robust monitoring plan over the last 3 years for the 24 key project indicators (KPI) related to environmental amelioration of ecosystem services and natural capital and 7 KPI related to economic performance, involving 8 technical partner teams, more than 30 experts covering 16 areas of impact.

Ecology
Botany
Microbiology
Forestry
Agronomy
Zoology
Ornitology
Entomology

Business
Marketing
Social science

Land
Owners
Producers

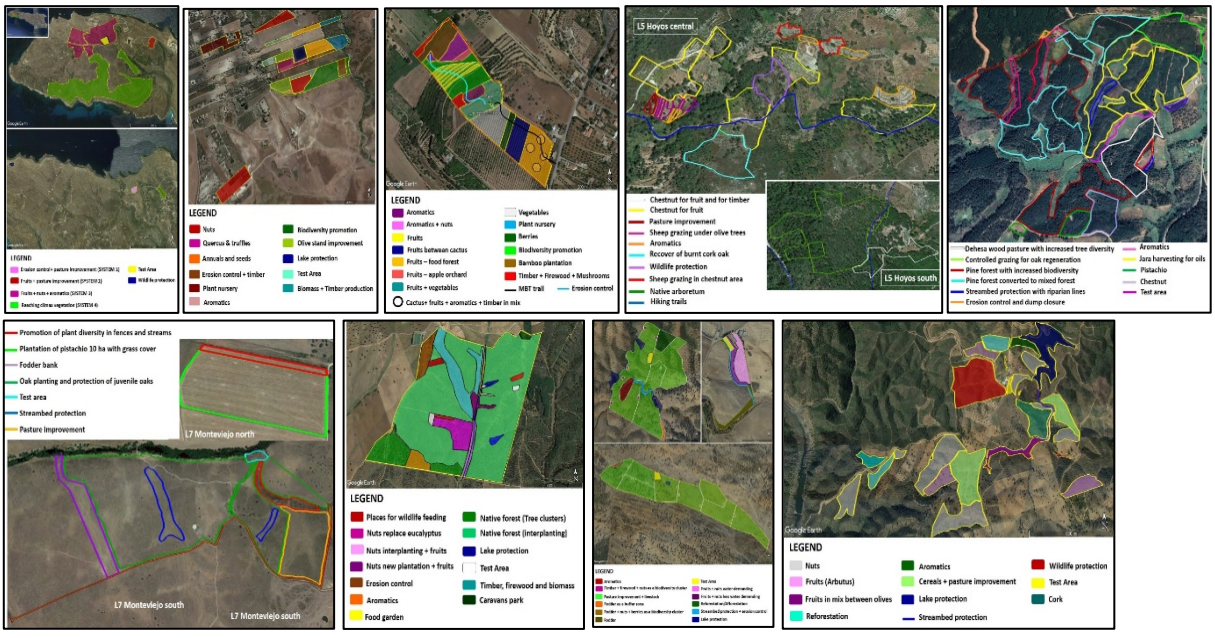
Soil science
Hydrology
Geography
Cartography
Climatology
Drones

KNOWLEDGE TRANSFER AND REPLICATION OF BEST PRACTICES

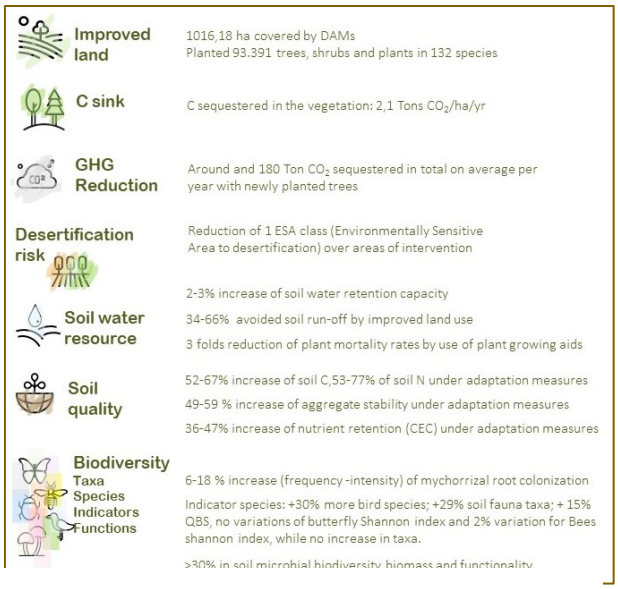
The second objective of Desert-Adapt was the scalability of best practices, by involving the community around the project areas and setting up knowledge transfer activities of replication, providing replication tools, information, demonstration activities during open days.

PROJECT RESULTS

Nine DAM plans of land management were created and tested over 1016.18 hectares. The plans included 120 different functions (land use goals) and 44 adaptation measures applied to generate environmental, economic and social benefits. The plans can be visioned in details on the web page of the project at http://www.desert-adapt.it/index.php/en/case-studies



The project demonstrated **significant improvement of ecosystem services** wherever adaptation measures were applied over 5 years.
It produced an intensive activity of dissemination and replication **engaging 85 new landowners for 10551,37 new hectares.**
http://www.desert-adapt.it/index.php/en/replicators-en/our-replicators
Created **11 new product commercial plans** and provided **9 business models** and one branding package to be used by landowners in outreach events and initiatives. Potential Internal Return Rate (IRR) were estimated on average 3% to 6% with max 22% increase, average potential revenues (in 12 yrs) between 100-200 €/ha.



AFTERLIFE OBJECTIVES

LAND SUSTAINABILITY OF THE STUDY AREAS

Desert-Adapt aims at increasing over time the level of adaptation and sustainability in the areas of intervention by continuous implementation of DAM plans by project partners and replicators over more than 11000 hectares. The next 5 years will be crucial for EU to show its capacity for climate mitigation, before the next Global Stock Takes milestone of 2028. EU farmers will be fully involved in the new objectives and strategies of Farm to Fork which will include the implementation of C farming systems and C credits certifications as well as food environmental certification protocols that will become increasingly relevant on the market. Desert-Adapt contributed to prepare our farmers to this challenge.

KNOWLEDGE SHARING WITHIN THE PARTNERSHIP

Knowledge sharing was at the core of the good results of the project. DAM could only be created by an osmosis of knowledge among partners representing different actors of the society with different experiences and points of view. Knowledge is at the basis of actionability hence Desert-Adapt aims at making a significant additional effort into supporting new partners and stakeholders that want to engage into the sustainability journey, in sharing the knowledge with technical experts, agronomists, on adaptation, with the scientific community to advance our knowledge on the link between land management, climate change, biodiversity, ecosystem services and land degradation. We also aim at

sharing the positive results with Accademia and farmers to provide tools for further planning and communication on adaptation measures at any level.

REPLICATION AND NETWORKING

The project activity found significant consensus during the project, with 85 new stakeholders interested to develop their own DAM. Although it is not possible to guarantee a full-time support for DAM development and implementation as during the project, the project will set up 5 open days online, with Q&A sessions, dedicated to those who have doubts and seek support on the DAM methodology. The Open days will be publicized on the webpage and Facebook page of the project at list one month in advance. In addition, also our landowners aim to have demonstrative open days in the future to share their best experiences as the project demonstrated that the most powerful instrument of engagement of citizens remains the joint action and hands-on activities. The project will also continue to network with the actual replicators and with the *Distretto Agroalimentare di Qualità Jonico Salentino,* Project of Regeneration of the Salento area, which includes 200 farms for about 5000 ha in areas under desertification risk in Pulia region (IT) and under Xilella fastidiosa treat.

AFTERLIFE COMMUNICATION AND DISSEMINATION

An intense plan of communication and dissemination of project results is planned as reported in table 1 for the coming 5 years. The project aims to reach all the stakeholders typologies that were engaged during the project as they are all relevant for the societal mind shift necessary for large scale adoption of adaptive and sustainable land management.

FUNDING SOURCES FOR AFTER-LIFE ACTIONS

In the following Table 1, we report the AFTERLIFE initiatives planned by project partners to support land sustainability, knowledge sharing, replication, dissemination and communication, the expected costs and the funding sources. Partners will contribute on their own funding mainly as man/hours, travels, publication costs in open source, meeting organization, costs of maintenance and implementation of DAM and sustainable management by partners in the next 5 years.

Table 1 – AFTERLIFE initiative planned by project partners to support land sustainability, knowledge sharing, replication, dissemination and communication.

Action description	Objective(s)	Target	Responsible partner(s)	Expected budget in € and Funding source
LIFE website: The website will be maintained online for 5 years after the end of the project and also enriched with afterlife content	To keep available the results, information and materials produced during the project and update on the most recent key finding/developments	General public, Accademia, policy makers, stakeholders with an interest in project topics and in replication	SUN	350 € SUN own funds
LIFE email address will be kept active in the AfterLIFE Plan and periodically checked for feedbacks.	To allow interactions with stakeholders and post-project networking	General public, Accademia, policy makers, stakeholders with an interest in project topics and in replication	SUN	200€ Virtual money as man/hours SUN
DROPBOX access to documents The dropbox will be available in the next 5 years with stored materials from the project available to all partners for download	To increase partners actionability on sustainable adaptive management and their dissemination capacity	Partners	SUN	1000 € SUN own funds
DESERT-ADAPT Facebook Will continue to post in the next 5 years news related to project topics and project results in the afterlife	To inform on hot topics for climate risk and desertification, news on best practices, results of the project from new analysis of data	General public, Accademia, policy makers, stakeholders with an interest in project topics and in replication	SUN, all	0€ Virtual money as man/hours SUN

Action description	Objective(s)	Target	Responsible partner(s)	Expected budget in € and Funding source
Landowners continue implementation of DAMs Partners L1-L11 will continue to implement their DAMs	To increase the level of sustainability and adaptation in the areas of the project	Landowners	L1-L11	225000 € L1-L11 invest 5000 euro/yr of their funds in land management
REPLICATORS visibility Replicators will be invited to send materials about their engagement that can be uploaded on the webpage	Increment the visibility of replicators and interest of stakeholders in replication	Replicators (farmers, landowners)	SUN with support by FIPs ALL,	200€ Virtual money as man/hours
REPLICATOR support sessions The project will make one call per year for open online session for Q&A sessions on DAM methodology and implementation	Support implementation of desertification adaptation plans and scale up best practices	Replicators (farmers, landowners), interested stakeholders	SUN, UNEX, UNIPA, ADPM	1000€ Virtual money as man/hours
Brochures, logo, LAYMAN's report, manifesto, policy tips, replication toolkit These materials are available and downloadable from the webpage	To help to further disseminate the project, its objectives, and achievements.	Partners, general public, stakeholders with an interest in adaptive management, policy makers, other EU projects and initiatives	SUN	0€
FOLLOW UP annual meetings Partners will organize possibly once per year a follow up meeting for those who can attend in interesting venues for Desert-Adapt	To continue the information exchange, networking, reciprocal support, open new initiatives	Project partners and special guests	All	17000€ Partners own funds (trip cost plus meeting organization)
DISSEMINATION in partners initiatives Partners will organize dissemination initiatives to raise interest in project results	To increase the visibility of the project and its results, disseminate best practices in the region.	1.Conference in PT on the fight to desertification, 2. Workshop in SP on adaptive measures to protect nature 3. Open days at partners 'land for sustainability walks, visits	1. NOVA FSCH, 2. Hoyos, UNEX 3. L1-L11, UNEX, ADPM	1000€ Partners own funding for meeting organization
DISSEMINATION of results in events / workshops / media news Desert-Adapt members expect to present project philosophy, tools and results to third-party events	To increase the visibility of the project results. To attract interest in project best practices adoption	10-15 events expected in the next 5 years where general public a more specialized stakeholder of Accademia or agronomic sector or policy can attend	All	7500€ Partners own funding for travel
ENGAGING students Oral presentations and training modules dedicated to the project will be included in university lectures held by the project partners, results will be further analyzed in scientific studies with student support, materials will be available for primary and secondary schools, visit will be available at project sites	To increase knowledge transfer on topic related to project objectives , climate change, land degradation risk, desertification risk	University students in nutrition, agronomy, environmental sciences, stakeholders of the involved universities (scientific community, municipalities, associations, citizens)	SUN, UNIPA, NOVA FSCH, FCUL, UNEX, ADPM, L7-Moraleia	2000€ Virtual money as man/hours
SCIENTIFIC publications Additional scientific papers will be published using project data	10 Publications in ISI journals and reviewed books to share project results	Scientific community	SUN, UNIPA, FCUL, UNEX, NOVA FSCH, FSG	20000€ Own funding for publication cost in open access
POLICY follow up Interaction with policy representative, tables to support best practices adoption to fight desertification, climate adaptation and land degradation	To strengthen present collaborations (ex. Consulta in Sicily, ISPRA, MASE, GELSO initiative, in IT) engage into policy discussion with present municipalities (Hoyos, Valverde, Lampedusa), engage into policy table (ADPM, Madeira L9, NOVA FSCH)	Policy makers at all levels	SUN, UNEX, UNIPA, NOVA FSCH, ADPM, L5, L6, SERPA	200€ Virtual money as man/hours

Desert-Adapt
Restore Nature, Change to Adapt

VISIT OUR WEBSITE
www.desert-adapt.it

FOLLOW US ON FACEBOOK
LIFE Desert-Adapt

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