

OPTIMUS PRIME – optimal greening of irrigated farmland to achieve a prime environment

Grant FCT-PTDC/ASP-AGR/29771/2017

Otimização de infraestruturas verdes em vales
agrícolas irrigados para promoção da qualidade
ambiental e biodiversidade

27/11/2018



Ordem de trabalhos

1- Apresentação da equipa

2- Consórcio

3- Parceria com a FCUL na parte de modelação hidrológica

4- Conceito e desenvolvimento do projecto

5- Calendarização de trabalhos para 2019

6-Aspectos logísticos e administrativos



OPTIMUS PRIME

- Início dia 1 de Outubro 2018 e final dia 30 de Setembro 2021
- Envolve CINCO PARCEIROS:
 - Instituto Superior de Agronomia
 - Nova Business School
 - AgroTejo
 - Associação Regantes Beneficiários do Vale do Sorraia
 - (convidado) FCUL <http://www.fciencias-id.pt/>



Objectivos



- Quantificação da biodiversidade e dos serviços de ecossistemas fornecidos vales irrigados através das configurações espaciais das estruturas não produtivas ECOLOGICAL FOCUS AREAS (EFA)
- Identificação das configurações espaciais que melhor optimizam a biodiversidade e os serviços
- Desenvolvimento de um calculador EFA ao nível da propriedade para auxílio de decisões do agricultor
- Simulação de variações de água e habitats disponíveis no ambiente dos vales irrigados e das consequências para a biodiversidade e serviços – diferentes cenários climáticos e tecnologia de rega
- Dois casos de estudo: bacia do Almonda/Agrotejo e do Sorraia/ARBVS (each 16.000ha; 20x8 km)
- Políticas agroambientais e seus trade-offs para diferentes cenários, discussão com stakeholders



1- Project actions

- Setting the matrix of farm units across the two target irrigated areas
- Overlay with the **configurations' map of ecological relevant units** using GIS tools
- Calculate patch configurations and connectivity using Patch Analyst and Conefor softwares
- Implement hydrological model SWAT at basin scale and downscale it to the irrigated valley level: water and nutrient flows across the valley
- Sample target biological indicators (meta-communities) in the ecological relevant units OR study areas OR farm units
- Link target indicators (meta-communities) with ERU spatial configurations in the study areas
- Evaluate the ERU value at farm level – Ecological Focus Areas EFA

The structural connectivity is given by the target-patch configurations

ECOLOGICAL RELEVANT UNITS are green landscape elements acting as habitat for a specific biological community in a given area



Target patches =
Ecological Relevant Units

Riparian structural
connectivity

Terrestrial structural
connectivity

Ecological Relevant Units:

- Riparian woody patches
- Woody wetlands

Ecological Relevant Units:

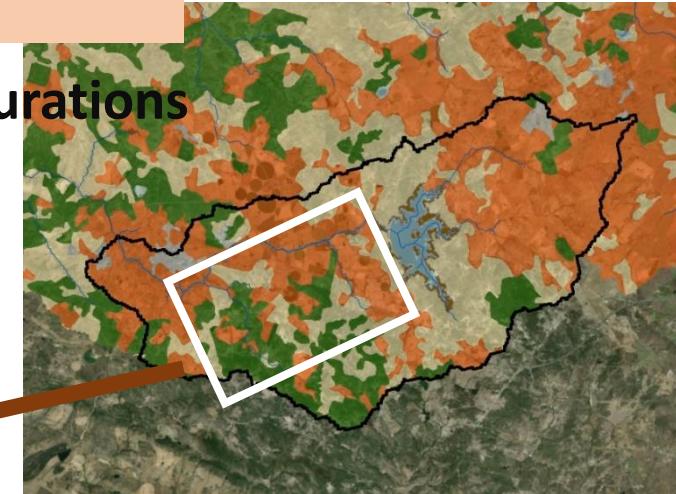
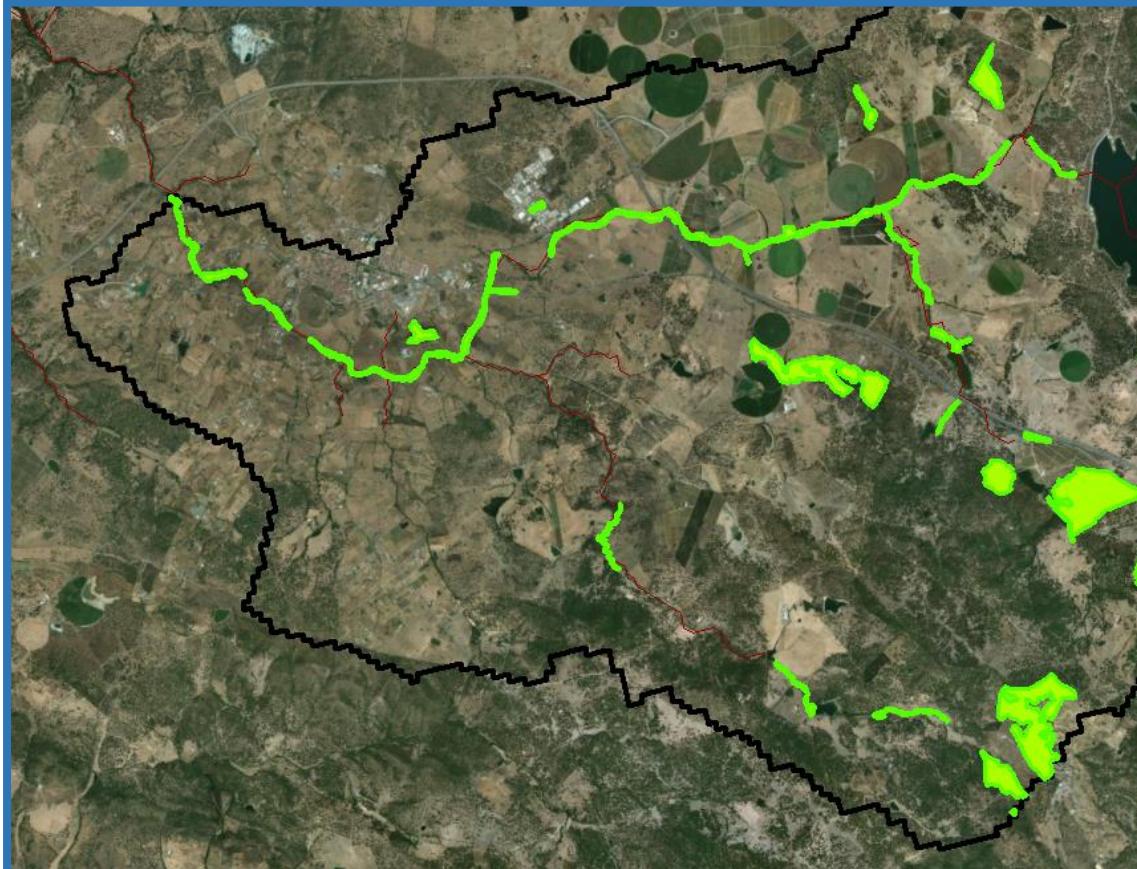
- Natural and semi natural Forest patches
 - Hedge patches
 - Roadside tree patches
 - Isolated woody tree/stands

Global structural connectivity
= Global patch configurations

STUDY AREAS

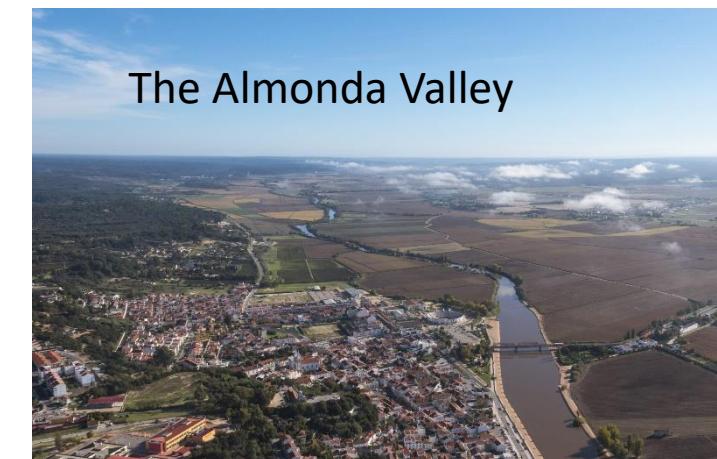
Calculation of the Structural Connectivity and Spatial Configurations

Ecological Relevant Units (ERU) are converted into Landscape metrics



Landscape metrics should represent:

- Area and Edge (e.g. Total area, Mean Patch Size, Edge Density, etc)
- Shape (e.g. Shape Index)
- Core (e.g. Number of core areas)
- Aggregation (Proximity Index, Similarity Index)

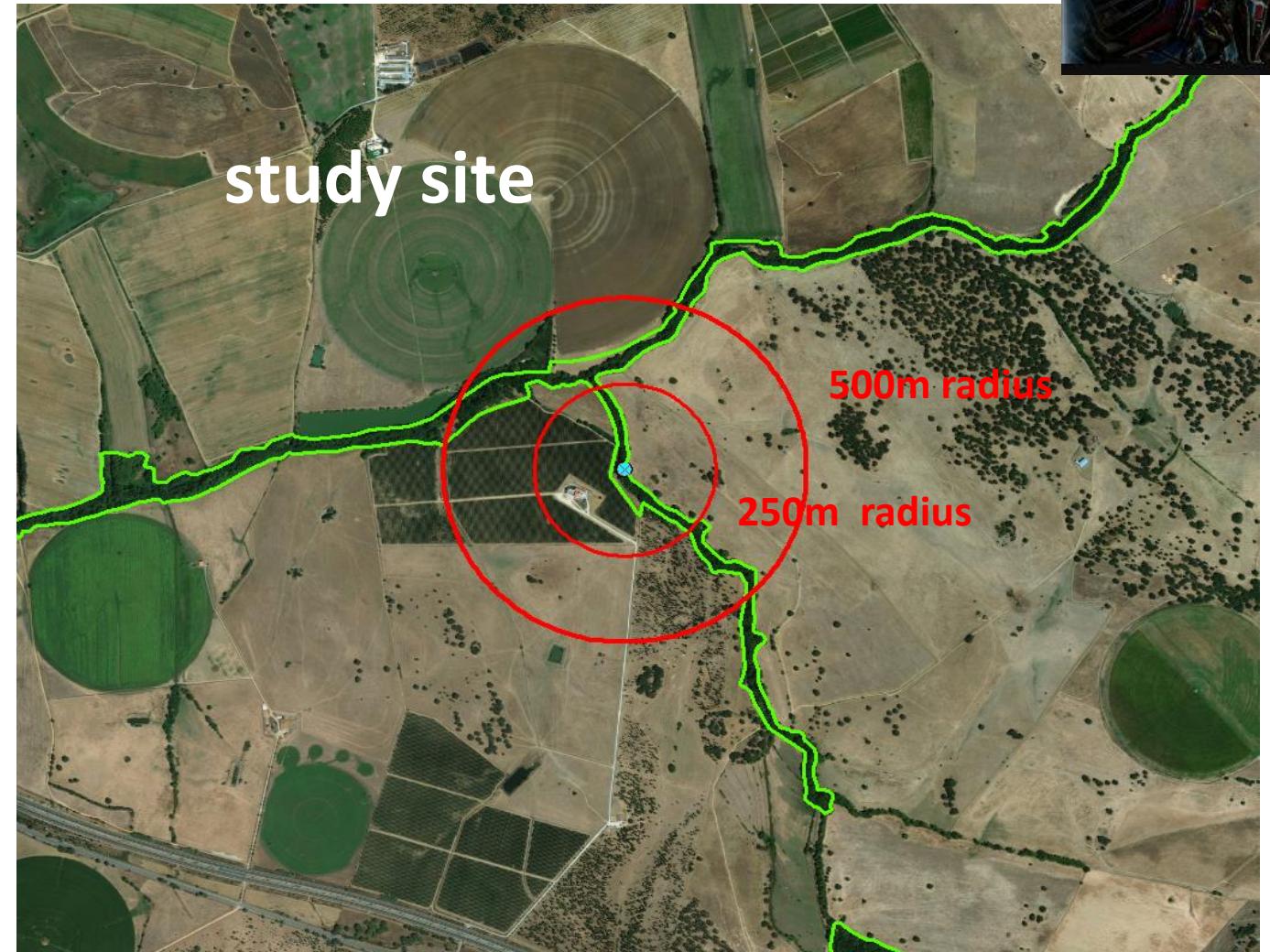


STUDY SITES

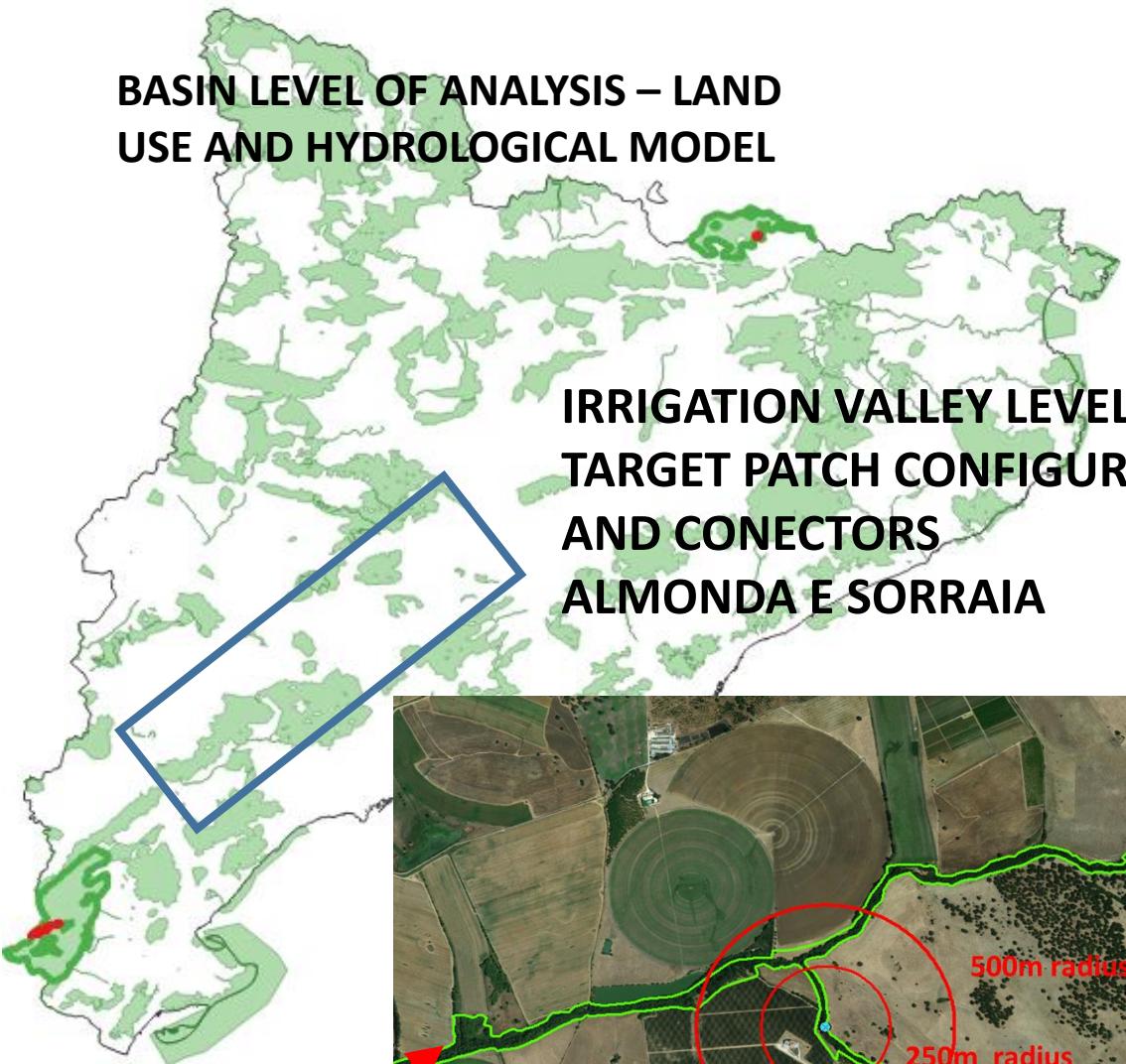
Ecological Relevant Units (ERU)

- Riparian woody patches and wetland woods (riparian component)
- Mature broadleaved forest patches (terrestrial component)
- Connectors (hedgerow habitats, Roadside tree patches Isolated woody tree, etc)

- On-screen analysis and manual digitalization
- Landscape metrics calculated
- Metrics should have an ecological significance for the target groups!

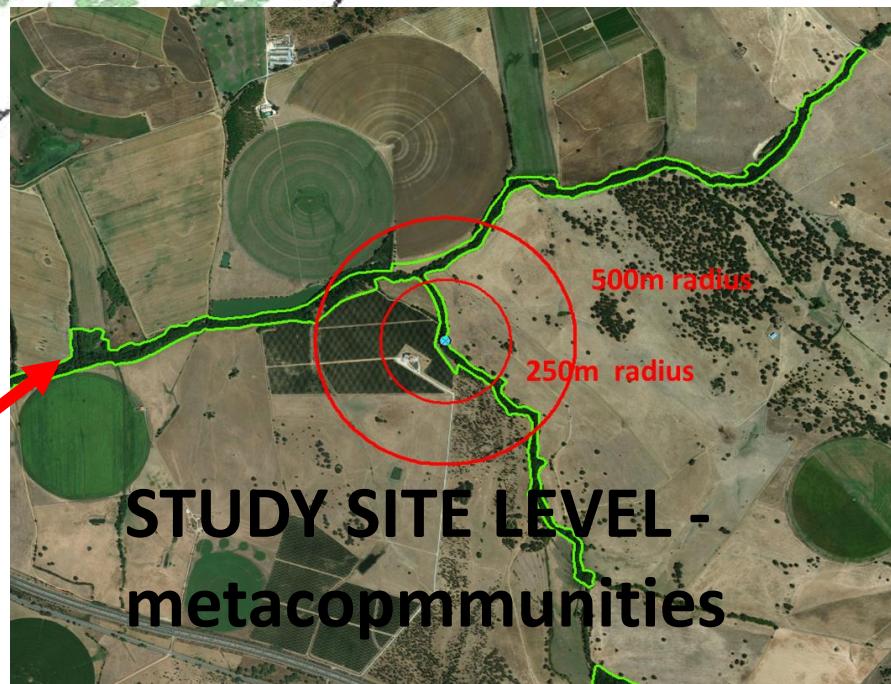


BASIN LEVEL OF ANALYSIS – LAND USE AND HYDROLOGICAL MODEL



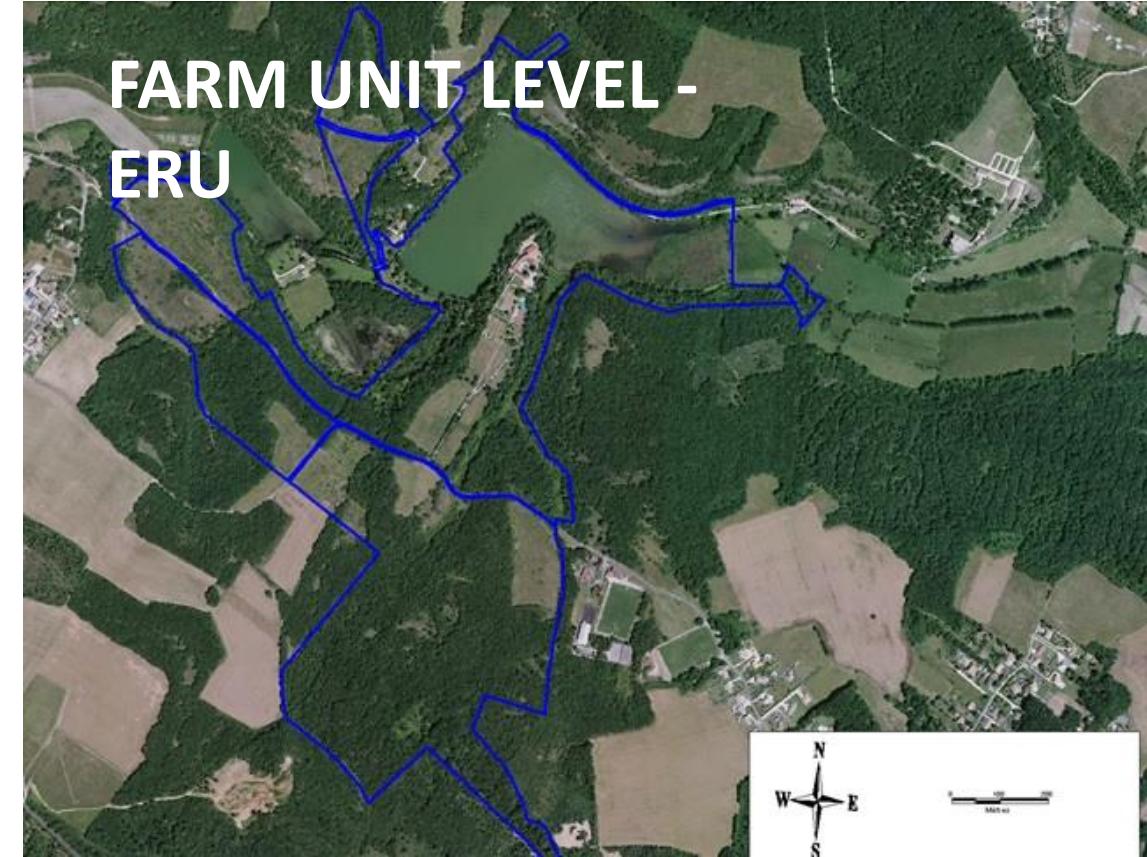
IRRIGATION VALLEY LEVEL -
TARGET PATCH CONFIGURATIONS
AND CONNECTORS
ALMONDA E SORRAIA

HABITAT
LEVEL -
populations



STUDY SITE LEVEL -
metacommunities

FARM UNIT LEVEL -
ERU



SCALES OF
ANALYSIS



2- Project actions



1. Beta biodiversity (STUDY SITE, NOT HABITATS): richness/diversity of ant group (250 m radius transects, pit falls, 2 days exposure) and bat group (1 km length radius, eco-recorders, 2 days exposure);
2. Functional richness, diversity and redundancy of target groups;
3. Guild representation: different habitat, feeding, shelter, reproduction and movement range;
4. Others considered: birds (point sample), plants (species surveys)



3- Project actions

1. Implementation of SWAT to predict flow of water and nutrients: filtering capacity of riparian buffers, vertical movement of water (atmosphere and aquifer); Basin and study areas
2. Ecosystem service: predation pressure (one month exposure of dummy caterpillars), and **pollination???**
3. Empirical modelling linking biodiversity and services to configurations
4. Economic valuation of the ecosystem services



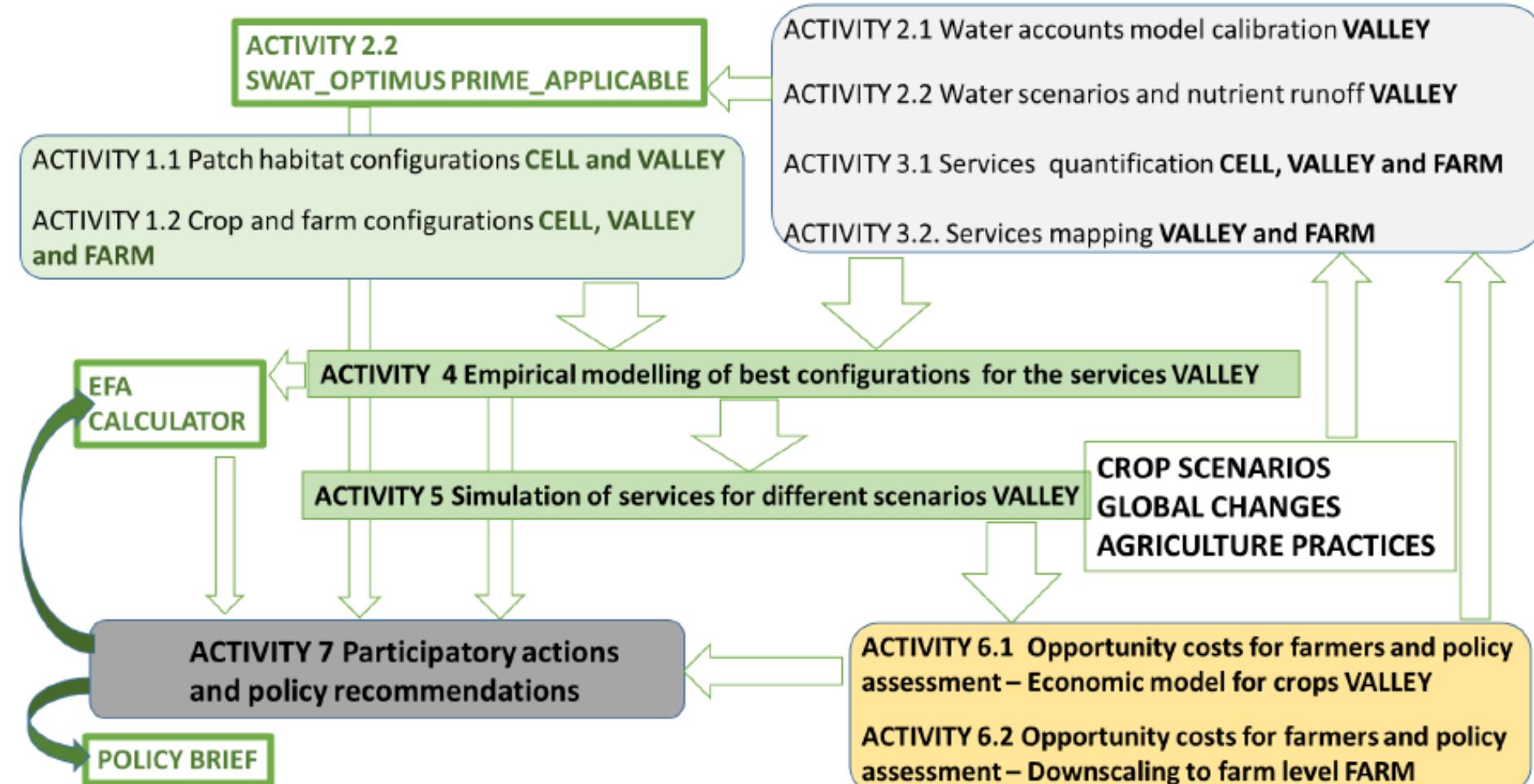


4- Project actions

- Interpolation of services and biodiversity to farm level
- Development of an excel tool to calculate the value of ecological set aside at farm level – Best-Service EFA calculator
- Simulation of different scenarios: climate, EFA management, agricultural practices improvement
- Evaluation of gains and losses of biodiversity and services **AT FARM LEVEL AND AT BASIN LEVEL** under different scenarios
- Participatory actions with farmers to release tool and project results
- Opportunity costs for farmers and policy assessment
- Policy briefing, e.g. CAP, DGADR



OPTIMUS PRIME - ACTIVITY FLOWCHART



COORDINATION

PI – Teresa Ferreira

Co-PI – José Lima Santos



EXECUTIVE BOARD

PI+co-PI+a key-person from each institution (Renato Rosas, Pedro Mendes, Gonçalo Sousa and João Pedro Nunes)

- Fluency in actions
- Conceptual model implementation
- Cross over of information
- Cooperative partner synergies



FARMERS & EXTERNAL COMMITTEE (EC)

- involved since the beginning,
- influencing method choices,
- scenarios and appreciating results,
- collaboration in final policy brief



Gonçalo Leal, **Pedro Teixeira**, Director of DGADR
Alexandra Brito, CAP

José Baranhona Núncio, FENARREG

Jorge Vasquez, EDIA

Sofia Batista, APA

PROJECT MANAGEMENT

SEVEN project meetings:

- Kick-off mainstreaming and concept alignment
- EB meeting before sampling – methodology development and first EC meeting (**MARCH 2019**)
- Early, mid and end of second year – results progresses
- Mid of third year – presentation of results at second EC meeting
- Final meeting- dissemination and outreach, with EC+EAC



EXTERNAL ADVISORY COMMITTEE (EAC)

Bruna Grizzeti, JRC

Ralf Ludwig, Munchen University

Felix Frances, Universidad de Valencia

Rui Santos and Paula Antunes, FCTUNL

ANÁLISE DAS ATIVIDADES

Atividade	Designação	Classificação	Elegível
1	Habitat patches and crop configurations: setting the scene	Investigação Industrial	22.571,85
2	Water accounts accross the irrigation valley	Investigação Industrial	57.005,41
3	Quantification of ecosystem services	Investigação Industrial	49.422,78
4	Empirical modelling of configurations and services	Investigação Industrial	37.005,41
5	Simulation of services and configurations for different scenarios	Investigação Industrial	23.545,81
6	Opportunity costs for farmers and policy assessments	Investigação Industrial	15.637,50
7	Innovation, participatory actions and policy recommendations	Gestão Técnica do Projeto	34.025,31
TOTAL			239.214,07

	<i>Proposto</i>	<i>Distribuição</i>
I - Investigação Industrial	205.188,76	85,78
D - Desenvolvimento Experimental		
G - Gestão Técnica do Projeto	34.025,31	14,22
T - Total	239.214,07	

ISA TO SEE WHAT KIND OF COSTS ARE ELEGIBLE, IF IT IS A FULL COST PROJECT, IF THE SALARIES OF PERMANENTS CAN BE USED IN CASE IT IS NOT, AND IF WE CAN ASK TO CHANGE THE SPENDING TYPES

FUNDING PER PARTNER

Elegível por CoPromotor (Mapa de Investimentos)



FUNDING PER TYPE

Elegível Corrigido

RUBRICAS	2017	2018	2019	2020	2021	2022	Total
a.i) Recursos Humanos		49.413,07	46.473,07	45.003,07			140.889,21
a.ii) Missões		7.092,00		3.730,05			10.822,05
a.iii) Instrumentos e Equipamento Científico		750,00					750,00
a.v) Subcontratos		20.000,00					20.000,00
a.vi) Registo de Patentes							
a.vii) Demonstração, promoção e divulgação			10.000,00	10.000,00			20.000,00
a.viii) Adaptação de edifícios e instalações							
a.ix) Aquisição de outros bens e serviços		2.910,00					2.910,00
b) Custos Indiretos		15.041,27	14.118,26	14.683,28			43.842,81
TOTAL		95.206,34	70.591,33	73.416,40			239.214,07

ISA TO SEE WHAT KIND OF COSTS ARE ELEGIBLE, IF IT IS A FULL COST PROJECT, IF THE SALARIES OF PERMANENTS CAN BE USED IN CASE IT IS NOT, AND HOW WE CAN ASK TO CHANGE THE TYPE OF SPENDING



Project reference : C492618810-00087805

Project title: OPTIMUS PRIME - Optimal greening of irrigated farmland to achieve a prime environment

Start date: January 1 2018

End date: December 31 2020

Task N°	Task Denomination	N Persons-month	Acronym of partner responsible	Acronyms of partners involved	Year 1												Year 2												Year 3															
					1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28	29	30	31									
1	Patch and crop configurations: setting the scene	23.20	ISA	ISA, AGROTEJO, ARBVS	M1					M2				M3	M4																													
2	Water accounts across the valleys	14.80	ISA	ISA, AGROTEJO, ARBVS													M1																											
3	Quantification of ecosystem services	40.60	ISA	ISA																																								
4	Empirical modelling of configurations and services	10.60	ISA	ISA																																								
5	Simulation of services for different scenarios	15.20	ISA	ISA, FE-UNL, AGROTEJO, ARBVS																																								
6	Opportunity cost for farmers and policy assessment	29.20	FE-UNL	FE-UNL, ISA, AGROTEJO, ARBVS																																								
7	Innovation, participatory actions and policy recommendations	28.40	ISA	ISA, FE-UNL, AGROTEJO, ARBVS																																								
				TOTAL	162.00					PM1					PM2					PM3					PM4					PM5					PM6					PM7				

F- FARMERS' INPUT

PMx - PROJECT MANAGEMENT MEETINGS

Px- PRODUCT RELEASES

Wx - WORKSHOPS

Mx- MILESTONES

1st Progress Report

2nd Progress Report

Final Report

OPTIMUS PRIME – OPTIMAL ECOLOGICAL ENGINEERING OF IRRIGATED FARMLANDSCAPES TO ACHIEVE PRIME NATURAL VALUES

PROJECT CONCEPTUAL

