



PRIMA

PARTNERSHIP FOR RESEARCH AND INNOVATION
IN THE MEDITERRANEAN AREA

Funded Projects 2023



Funded Projects 2023



PORTUGAL /PT



SPAIN /ES



FRANCE /FR



LUSSEMBURGO /LU



GERMANY /DE



MOROCCO /MA



ALGERIA /DZ



TUNISIA /TN



ITALY /IT



MALTA /MT





SLOVENIA /SI



GREECE /GR



TURKEY /TR



LEBANON /LB



CYPRUS /CY



CROATIA /HR



EGYPT /EG



ISRAEL /IL



JORDAN /JO





The current document has been prepared by the PRIMA Foundation, which is the ad-hoc legal entity responsible for the implementation of the PRIMA Initiative.



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PRIMA, Funded Projects 2023 - September 2024

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Calls Report PRIMA 2023

The background features a large, light green watermark of the PRIMA logo. It consists of a semi-circle on the left, a stylized plant with a central stem and several leaves on the right, and a wavy line at the bottom representing soil or water.

Section 1 /S1 at a glance

9



159

Proposals submitted

Funded Projects

of which

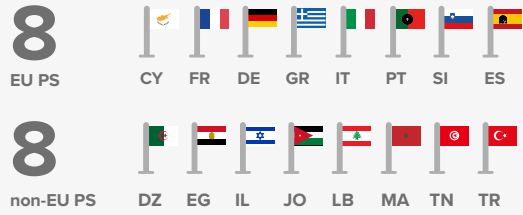
Projects per nationality of coordinating RU



Projects per thematic area

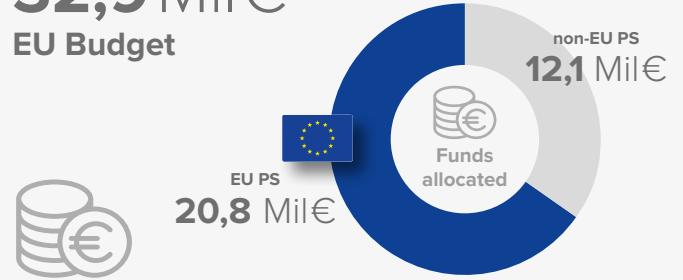
16

Participating States /PS
of which



32,9 Mil€

EU Budget

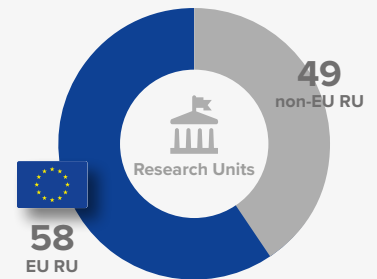
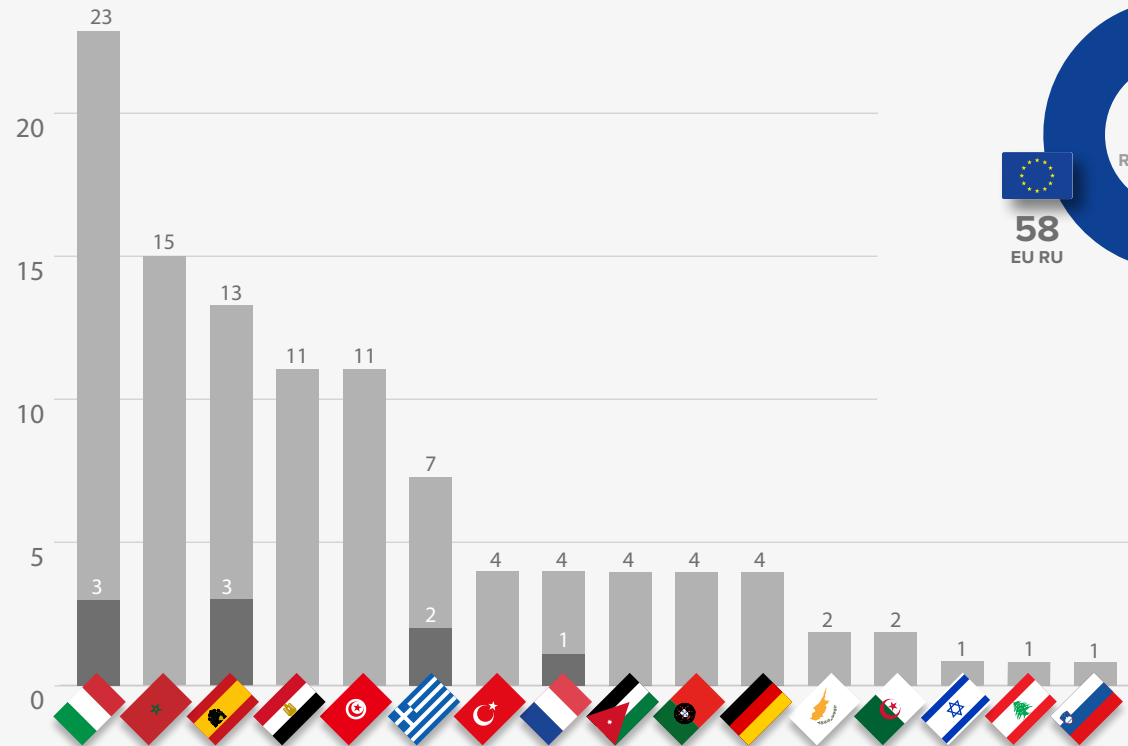


4 RIAs 5 IAs



Actions per thematic area

107

 Research Units/ RU

Calls Report PRIMA 2023

Section1 /S1

Projects per thematic area



Water Management






















































































Farming Systems



Agro-food Value Chain



Nexus

Funded Projects	Participating States	Research Units	Budget
1  CIRQUA Integrated Approaches at Local Scale for Enhancing Water Reuse Efficiency and Sustainable Soil Fertilization from Wastewater's Recovered Nutrients Project factsheet on page 48	Greece	 	
	Italy	 	4.270.000,00 €
	Tunisia	 	    
	Cyprus		    
	Egypt		    
	Germany		    
	Morocco		    
	Portugal		    
	Spain		  
	Turkey		
	10	13	
2  SPORE-MED Sustainable upgrades WWTPs for resource recovery, water reuse and health surveillance in the Mediterranean region Project factsheet on page 50	Spain	  	3.630.284,00 €
	Cyprus		    
	Egypt		    
	Greece		    
	Italy		    
	Morocco		    
	Tunisia		
	7	9	

3

**TRANSFORMED**

Transforming the mediterranean region through agroforestry: large scale restoration of degraded lands by overcoming the socioeconomic and sociocultural barriers for agroforestry adoption

Project factsheet on page 52

**RIA**

Spain



Morocco



Portugal



Tunisia



Turkey



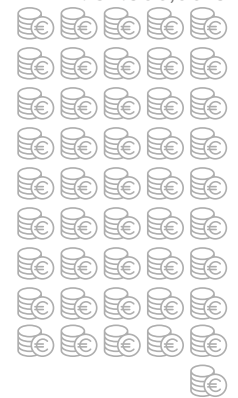
France



Germany

**7****16**

4.132.500,00 €



4

**VENUS**

Converting marginal lands of the mediterranean basin into productive and sustainable agro-eco-systems using low water demanding neglected and underutilized species

Project factsheet on page 54

**IA**

Greece



Italy



Egypt



Algeria



Jordan



Morocco



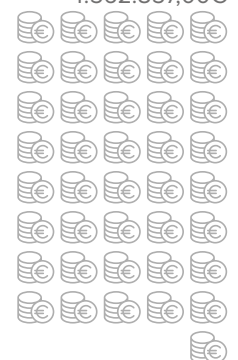
Spain



Tunisia

**8****13**

4.562.857,00€



5

**CERERE**

Cereals REsiliency REvolution for agile supply chain management in the Mediterranean

Project factsheet on page 56

**RIA**

Italy



Egypt



Germany



Israel



Portugal



Tunisia



Turkey

**7****10**

2.750.000,00 €



6

**SEEDS**

Sustaining Economies and Enhancing Dynamic Structures

Project factsheet on page 58

**IA**

Italy



Egypt



Tunisia



Jordan



Morocco



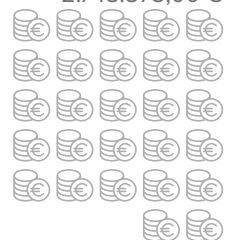
Spain



Greece

**7****16**

2.748.875,00 €



7

**STAPLES**

Stable food Access and Prices and Lower Exposure to Shocks

Project factsheet on page 60

**RIA**

Italy		2.692.925,00 €
Egypt		
Spain		
Morocco		
	4	9

8

**DIONYSUS**

Operational adaptation Nexus-based systems solutions in Mediterranean

Project factsheet on page 62

**IA**

France		
Italy		4.077.000,00 €
Egypt		
Greece		
Morocco		
Algeria		
Germany		
Tunisia		
Turkey		
	9	14

9

**RES-MAB**

Promoting WEFE Nexus-based adaptation and mitigation solutions and landscape resilience to climate change in the Mediterranean Biosphere Reserves

Project factsheet on page 64

**IA**

Spain		4.055.000,00 €
France		
Italy		
Jordan		
Lebanon		
Morocco		
Slovenia		
	7	10

Section 2 /S2 at a glance

27



56
Proposals submitted

Funded Projects

of which

Projects per nationality of coordinating RU



19

Participating States /PS
of which

11

EU PS



8

non-EU PS

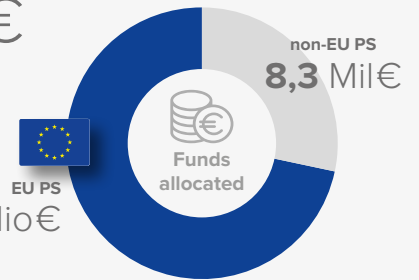


30,9 Mil€

Budget
Participating States



22,6 Mio€



2



8



17

Projects per thematic area

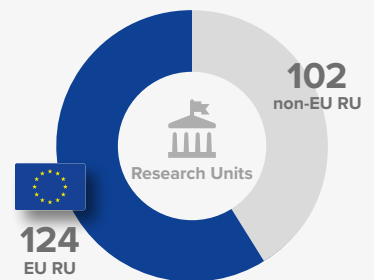
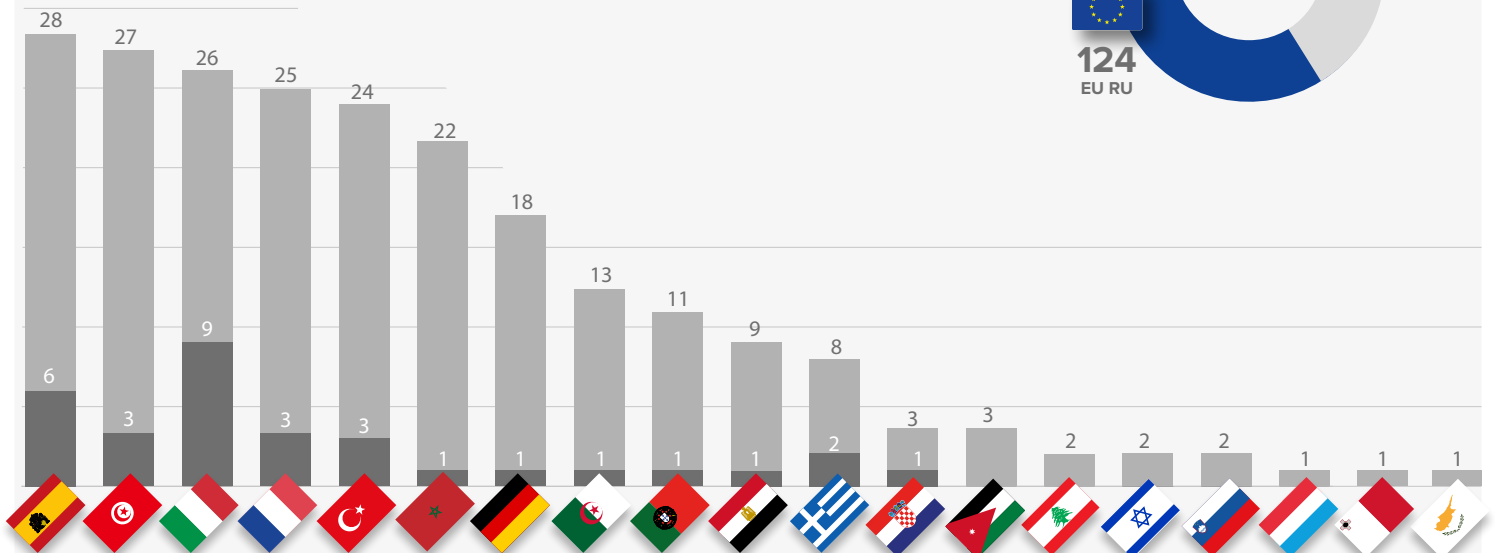
27 RIAAs

Actions



226

Research Units/ RU





Section2 /S2

Projects per thematic area

Funded Projects	Participating States	Research Units	Budget
<p>1</p> <p>Sm@awa-Medi New intelligent process combining nanotechnology magnetization-filtration of brackish and natural waters with a view to better irrigation efficiency and agricultural yield in the Mediterranean Project factsheet on page 68</p>	Tunisia		440.000,00 €
	Egypt		
	Morocco		
	Algeria		
	France		
	Spain		
	6	13	
<p>2</p> <p>WATER4MED Water management strategies and Adaptation acTions uNDER a global change context FOR the MEDiterranean region Project factsheet on page 70</p>	Spain		984.468,00 €
	Germany		
	Italy		
	Jordan		
	Morocco		
	Portugal		
	Tunisia		
7	7		
<p>3</p> <p>3D-STELLAR 3D Solar disTILLer and flash pyroLysis for recycling oLIVE mill wastewater into irrigation water and biochAR Project factsheet on page 72</p>	France		610.000,00 €
	Morocco		
	Tunisia		
3	5		
<p>4</p> <p>BIOACT Benefits assessment of on-farm regenerative agricultural practices on durum wheat systems to promote climate energy-based sustainability and food security in the Mediterranean area Project factsheet on page 74</p>	Italy		1.186.700,00 €
	Algeria		
	France		
	Spain		
	Tunisia		
5	7		

5

**CombiFarm**

Combining low-cost biochar, biogas, and cyanobacteria fertigation technologies with low-input crops for sustainable bioproducts in smart circular farming systems

Project factsheet on page 76



RIA

Tunisia	
Morocco	
France	
Germany	
Turkey	
Slovenia	

758.106,00 €

6 12

6

**CYCLOLIVE**

From waste to resource: ReCYCLing OLIVE oil extraction byproducts for sustainable agricultural practices in the Mediterranean

region

Project factsheet on page 78



RIA

Morocco	
Italy	
France	
Germany	
Jordan	
Spain	
Tunisia	
Turkey	

1.475.091 €

8 9

7

**EcoFertiS**

Innovative processing of manures and biowastes of Eco-friendly Fertilizers

Project factsheet on page 80



RIA

Algeria	
Egypt	
France	
Germany	
Tunisia	
Turkey	

788.077,00€

6 10

8

**PAVER**

Precision AgriVoltaics for Carbon Neutrality Enhanced Production and Reduced Environmental Impact in Greenhouse

Project factsheet on page 82



RIA

Spain	
Morocco	
Egypt	
France	

790.100,00 €

4 7

9

**Sun2Fork**

Sustainable greenhouse farming systems: from sun to fork

Project factsheet on page 84



RIA

Italy	
Israel	
Morocco	
Portugal	
Spain	
Turkey	

603.136,00 €

6 7

10

**SUPREM-MILK**

owards a more sustainable and resilient Mediterranean milk supply chain
Project factsheet on page 86



RIA

Italy France Turkey Egypt Morocco Spain **6** **10**

1.209.722,00 €



11

**A-BLOCK**

Nano-Enabled Antimicrobial Food Packaging Incorporating Natural Bioactives from Mediterranean Agri-Wastes
Project factsheet on page 88



RIA

Turkey France Germany Greece Luxemburg **5** **7**

1.109.000,00 €



12

**AgriBioPack**

Valorizing Agrifood Residues for Bio-based Packaging Solutions
Project factsheet on page 90



RIA

Italy Turkey Morocco Spain Croatia France **6** **13**

1.401.031,00 €


13

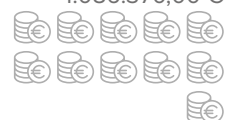
**BIOMEDPACK**

Shelf-life Enhancing Packaging Systems for Mediterranean Food through Innovative and Circular Solutions Based on Agri-Food Multi-Product Cascade Biorefinery
Project factsheet on page 92



RIA

Spain Germany Morocco Algeria Italy Turkey Tunisia **7** **10**

1.086.370,00 €


14

**DurInnPack**

Innovative Packaging and edible coatings to guarantee post-harvest Durability of Mediterranean fruits and vegetables production
Project factsheet on page 94



RIA

Spain Algeria France Italy Morocco Portugal Tunisia **7** **8**


1.186.544,00€


15

**EVOLVEPACK**

Design processing and characterization of innovative biodegradable and compostable active packaging structures to improve food safety of mediterranean foods

Project factsheet on page 96

**RIA**Spain Turkey Croatia France Israel Morocco Portugal Slovenia **8****10**

1.559.053,96 €



16

**FoWRSaP**

Agro Food Waste Recovery: new processing technologies for food Safety and Packaging

Project factsheet on page 98

**IA**Tunisia Spain France Morocco Turkey Algeria Jordanian Italy Greece Portugal **10****18**

1.751.524,00 €





17

**INTACTBioPack**

INTelligent, ACTive MicroBIOme-based, biodegradable PACKaging for Mediterranean food

Project factsheet on page 100

**RIA**France Tunisia Turkey Algeria Croatia Egypt Italy Portugal Spain **9****11**

1.620.574,00 €




18

**MATE4MEAT**

Innovative and safe antimicrobial bioplastics for food preservation in the Mediterranean area

Project factsheet on page 102

**RIA**Italy Turkey Algeria Cyprus Germany Spain **6****9**

1.442.971,00 €



19

**NOVAPACK**

Novel antimicrobial coatings and packaging in the mediterranean

Project factsheet on page 104

**RIA**

Portugal



Spain



Tunisia



Egypt

**4****8**

999.768,00 €



20

**NOVISHPAK**

Novel biodegradable, antimicrobial and smart packaging and coatings for increased shelf-life of Mediterranean fish filets

Project factsheet on page 106

**RIA**

Greece



Algeria



France



Germany



Malta



Morocco



Tunisia

**7****9**

1.620.00,00 €



21

**OLIVEPACK**

Bio-based antimicrobial packaging materials to increase the shelf life of naturally fermented low-salt table olives

Project factsheet on page 108

**RIA**

Turkey



Portugal



Spain



Tunisia

**4****6**

504.492,00 €



22

**PASPACK 4.0**

Producing Alternative Sustainable food bio-based PACKaging from Mediterranean agri-food by-products and waste

Project factsheet on page 110

**RIA**

Portugal



Germany



France



Lebanon



Morocco



Croata



Italy



Tunisia



Turkey

**9****16**

993.881,00€



23

**PLAMINPACK**

PLAnt-based antiMicrobial aNd circular PACKaging for plant products

Project factsheet on page 112

**RIA**

Italy



Germany



Algeria



France



Greece



Morocco



Tunisia

**7****10**

2.019.816,00€



24

**QuiPack**

Food value chain intelligence and integrative design for the development and implementation of innovative food packaging according to bioeconomic sustainability criteria

Project factsheet on page 114



RIA

Germany	
Greece	
Morocco	
France	
Italy	
Portugal	
Spain	
Tunisia	
Turkey	

9

13

2,075.283,00 €



25

**SAFOOD4MED**

Innovative and safe antimicrobial bioplastics for food preservation in the Mediterranean area

Project factsheet on page 116



RIA

Italy	
Morocco	
Algeria	
Egypt	
Germany	

5

8

978.280,00 €



26

**SAPHIRA**

Sustainable Antimicrobial Packaging based on a Healthy Intelligent Renewable Approach

Project factsheet on pagee 118



RIA

Italy	
Egypt	
Morocco	
Spain	
Tunisia	
Turkey	

6

8

827.691,00 €



27

**SuN4Med**

Sustainable and Novel Food Packaging based on Agro-industrial By-products and Natural Antimicrobials from the Mediterranean Area

Project factsheet on page 120



RIA

Spain	
France	
Tunisia	
Turkey	
Morocco	

6

11

1.052.584,00 €



Calls Report PRIMA 2022

Sections S1+S2 overall data

36

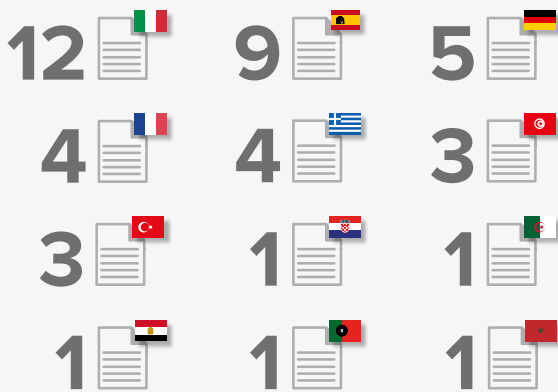


272
Proposals submitted

Funded Projects

of which

Projects per nationality of coordinating PS

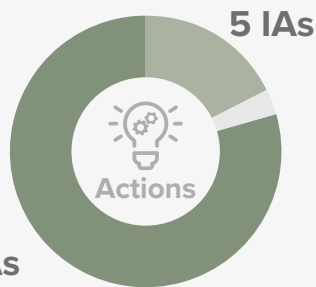


Projects per thematic area

Research and Innovation Actions



Innovation Actions



31 RIAs

Actions per thematic area

19

Participating States /PS
of which

11

EU PS



8

non-EU PS

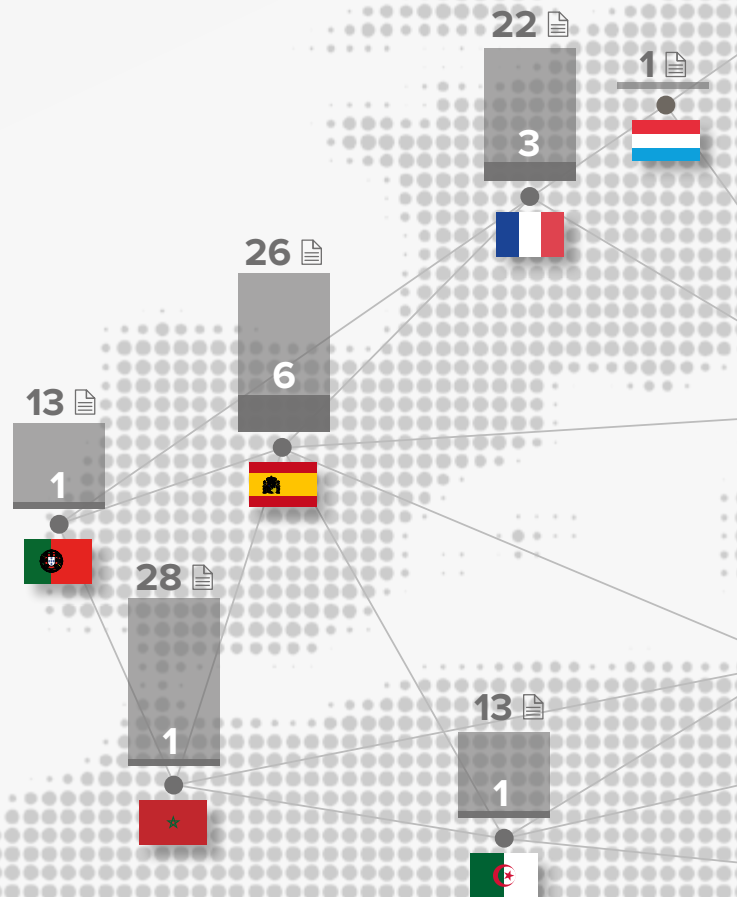
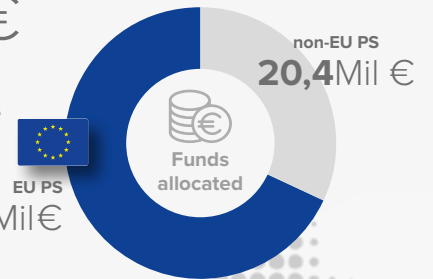


63,8 Mil€

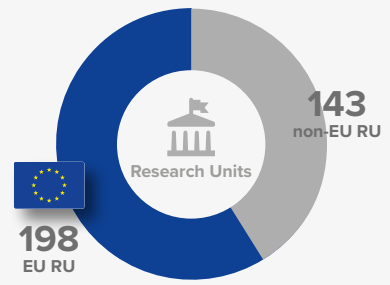
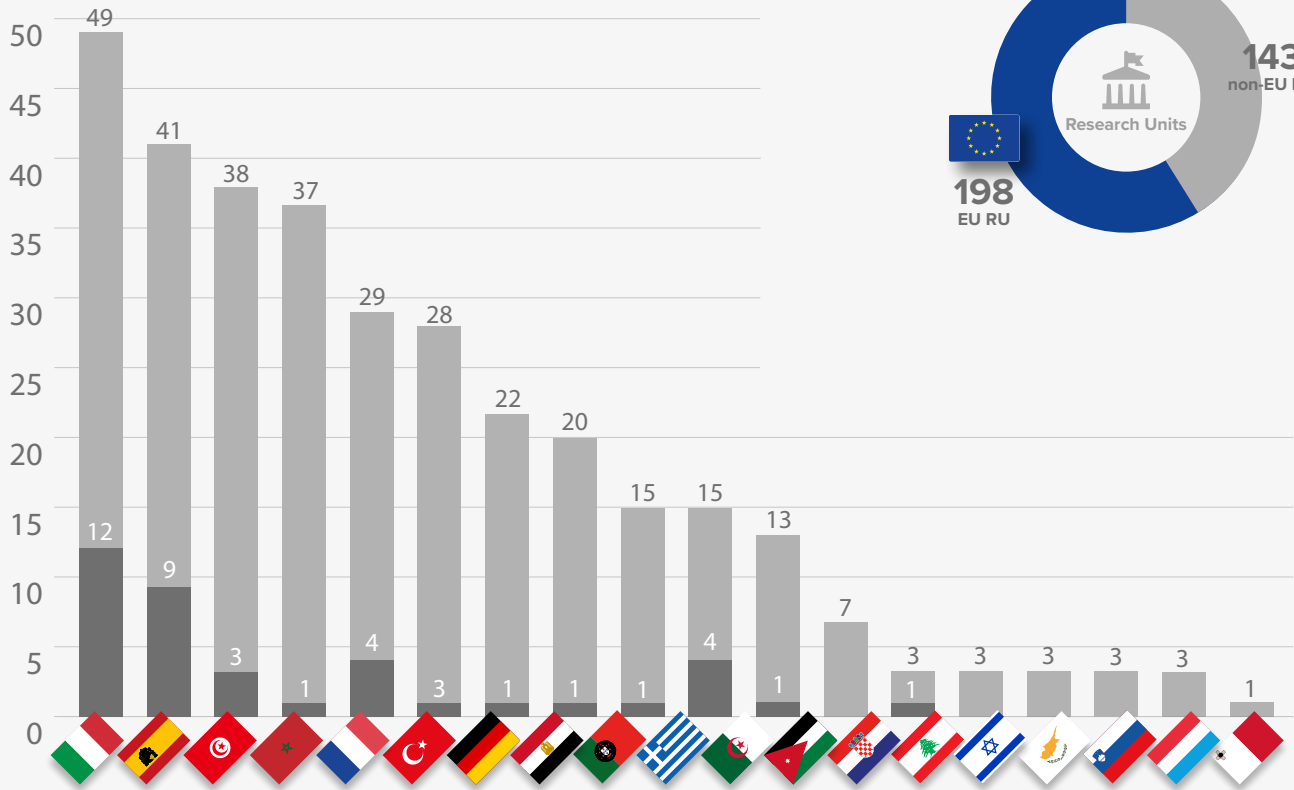
Budget
EU+Participating States



43,4 Mil€



346 Research Units

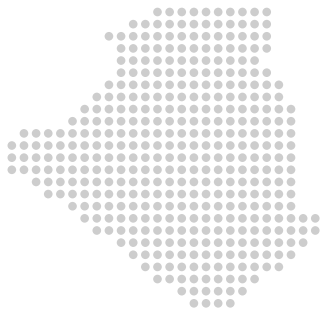




Data per Participating States and Research Units



ALGERIA /DZ



Budget
1.48 Mln €



14 Research Units



of which



13 Projects

involve one or more
algerian Research Units

1 Project

is coordinated by
an algerian Research Unit

Projects per thematic area



1

Sm@wa-Medi2023
/ S2



3

BIOACT /S2
Eco-FertiS /S2
VENUS /S1



8

BIOMEDPACK /S2
DurlInnPack /S2
FoWRSaP /S2
INTACTBioPack /S2
MATE4MEAT /S2
NOVISHPAK /S2
PLAMINPACK /S2
SAFOOD4MED /S2



1

DIONYSUS /S1

Typology	Research Units	Projects <small>underline indicates coordinated project</small>
2 Research Foundation	Faculty of Nature and Life Sciences, University of El Oued	<u>Sm@wa-Medi2023</u> /S2
	ESSAIA	<u>NOVISHPAK</u> /S2
12 Public Entities	University of Science and Technology Houari Boumediene (USTHB)	<u>VENUS</u> /S1 <u>Eco-FertiS</u> /S2
	Ecole Nationale Supérieure Agronomique (ENSA)	<u>BIOACT</u> /S2 <u>Eco-FertiS</u> /S2
	Centre de Recherche Scientifique et Technique en Analyses Physico – Chimique (CRAPC)	<u>Eco-FertiS</u> /S2
	Université de Mostaganem Abdelhamid Ibn Badis (UMAB)	<u>Eco-FertiS</u> /S2
	Université Frère Mentouri-Constantine 1 (UFMC1)	<u>BIOMEDPACK</u> /S2
	Centre de Recherche Scientifique et Technique en Analyses Physico-chimiques	<u>DurlInnPack</u> /S2
	University of Bejaia	<u>FoWRSaP</u> /S2
	Université Mouloud Mammeri de Tizi-ouzou (UMMTO), Laboratoire Qualité Sécurité des Aliments	<u>INTACTBioPack</u> /S2
	Université Abderrahmane Mira – Béjaïa (UAMB)	<u>MATE4MEAT</u> /S2
	University Abdelhamid Ibn Badis of Mostaganem	<u>PLAMINPACK</u> /S2
	University of Biskra UMKB	<u>SAFOOD4MED</u> /S2
	Research Center for Applied Economics for Development (CREAD)	<u>DIONYSUS</u> /S1



CROATIA /HR



Budget
0.45 Mln €



3 Research Units



4 Projects

involve one or more
croatian Research Units

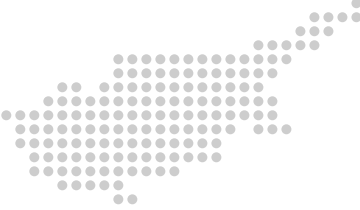
Projects per thematic area



4

AgriBioPack /S2
EVOLVEPACK /S2
INTACTBioPack /S2
PASPACK 4.0 /S2

Typology	Research Units	Project (il nome sottolineato indica Project coordinato)
3 Public Entities	University of Split	AgriBioPack /S2
	University of Zagreb (UNIZG)	EVOLVEPACK /S2 PASPACK 4.0 /S2
	University of Zagreb, Faculty of Food Technology and Biotechnology (UNIZG-PBF)	INTACTBioPack /S2



Budget
0.78 Mln €

2 Research Units



3 Projects
involve one or more
cypriot Research Units

Projects per thematic area

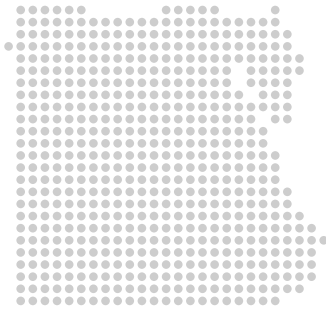
2
CIRQUA /S1
SPORE-MED /S1

1
MATE4MEAT /S2

Typology	Research Units	Projects <small>underline indicates coordinated project</small>
1 Public Entities	University of Cyprus (UCY)	<u>CIRQUA</u> /S1 <u>SPORE-MED</u> /S1
1 Research Foundation	C.I.P. Citizens in Power (CIP)	<u>MATE4MEAT</u> /S2



EGYPT /EG



Budget
1.42 Mil €



20 Research Units
of which **3 SMEs**



15 Projects

involve one or more
egyptian Research Units

Projects per thematic area



3

CIRQUA /S1
SPORE-MED /S1
Sm@wa-Medi /S2



4

EcoFertiS /S2
PAVER /S2
SUPREM-MILK /S2
VENUS /S1



7

CERERE /S1
INTACTBioPack /S2
NOVAPACK /S2
SAFOOD4MED /S2
SAPHIRA /S2
SEEDS /S1
STAPLES /S1



1

DIONYSUS /S1

Typology	Research Units	Projects <small>underline indicates coordinated project</small>
8 Public Entities	Ain Shams University (ASU)	CIRQUA /S1
	Cairo University (CUN)	SPORE-MED /S1
	City of Scientific Research and Technological Applications (SRTA-City)	Sm@wa-Medi /S2
	Arab Academy for Science, Technology and Maritime Transport (AASTMT)	EcoFertiS /S2
	South Valley University (SVU)	EcoFertiS /S2
	Nile University (NU)	INTACTBioPack /S2
	Agricultural Research Centre ARC	SAFOOD4MED /S2
	Institute of National Planning (INP)	DIONYSUS /S1
3 Diverse Private	Participatory Development Solutions – EIMahrousa PDS	VENUS /S1
	The American University in Cairo	CERERE /S1
	Confederation of Egyptian European Business Associations	STAPLES /S1
3 Research Foundations	National Research Center Cairo (NRC)	Sm@wa-Medi /S2 SAPHIRA /S2 NOVAPACK /S2
	ARRI Animal Reproduction Research Institute	SUPREM-MILK /S2
	Agricultural Research Center	SEEDS /S1
3 SMEs	DELTA WATER	Sm@wa-Medi /S2
	Green Power for Agriculture and Irrigation (GPAI)	PAVER /S2
	Healthtech	SEEDS /S1
3 Associations	Confederation of Egyptian European Business Associations	SEEDS /S1
	Economic Research Forum	STAPLES /S1
	Egyptian Association for Sustainable Development (EASD)	DIONYSUS /S1



FRANCE /FR



Budget
7.23 Mln €



29 Research Units
of which **2 SMEs**



of which



22 Projects

involve one or more
french Research Units

3 Projects

are coordinated by
a french Research Unit

Projects per thematic area



1

Sm@wa-Medi /S2



8

3D-STELLAR /S2
BIOACT /S2
CombiFarm /S2
CYCLOLIVE /S2
Eco-FertiS /S2
PAVER /S2
SUPREM-MILK /S2
TRANSFORMED /S1



11

A-BLOCK /S2
AgriBioPack /S2
DurInnPack /S2
EVOLVEPACK /S2
FoWRSaP /S2
INTACTBioPack /S2
NOVISHPAK /S2
PASPACK 4.0 /S2
PLAMINPACK /S2
QuiPack /S2
SuN4Med /S2



2

DIONYSUS /S1
RES-MAB /S1



	Institut Jean Lamour (IJL)	3D-STELLAR /S2
	French National Research Institute for Agriculture, Food and Environment	3D-STELLAR /S2
	Laboratoire de Genie des Procédés - Environnement - Agroalimentaire	CombiFarm /S2
	University of Lorraine	CYCLOLIVE /S2
	Université de Reims Champagne-Ardenne (URCA)	Eco-FertiS /S2
	University of Haute Alsace (UHA)	PAVER /S2
	INRAE UMR SADAPT	SUPREM-MILK /S2
	Unilasalle	SUPREM-MILK /S2
	University Claude Bernard Lyon	A-BLOCK /S2
	University of Technology of Compiègne	AgriBioPack /S2
21 Public Entities	University of Grenoble Alpes (LGP2 INP)	DurlInnPack /S2
	University of Bourgogne	EVOLVEPACK /S2
	Université Bretagne sud	FoWRSaP /S2
	Université de Montpellier	INTACTBioPack /S2
	VetAgro Sup (VetAgro Sup)	PASPACK 4.0 /S2
	AgroParisTech	PLAMINPACK /S2
	Ecole Nationale Vétérinaire, Agroalimentaire et de l'Alimentation Nantes Atlantique	QuiPack /S2
	IS2M, CNRS Mulhouse	SuN4Med /S2
	APTAR CSP Technologies	SuN4Med /S2
	Mont-Ventoux Natural Regional Park (Mont-Ventoux)	RES-MAB /S1
	Organization for the Defense and Management of AOC Ventoux (AOC Ventoux)	RES-MAB /S1
1 Association	Research Institute for Organic Agriculture	TRANSFORMED /S1
2 SMEs	Mind and go	CombiFarm /S2
	Sustainable AgriFoodtech Innovation & Research (SAFIR)	PASPACK 4.0 /S2
4 Research Foundations	University of Grenoble / Université Savoie Mont Blanc	Sm@wa-Medi /S2
	Institute de Research pour le développement (IRD)	BIOACT /S2
	International Centre for Advanced Mediterranean Agronomic Studies - Montpellier	NOVISHPAK /S2
	Mediterranean Agronomic Institute of Montpellier (IAMM)	DIONYSUS /S1
1 Diverse Private	Centre Technique Industriel de la Plasturgie et des Composites	FoWRSaP /S2



GERMANY /DE



Budget
3.58 Mln €



22 Research Units
of which **6 SMEs**



of which



17 Projects

involve one or more
german Research Units

1 Projects

are coordinated by
a german Research Unit

Projects per thematic area



2

CIRQUA /S1
WATER4MED /S2



4

CombiFarm /S2
CYCLOLIVE /S2
Eco-FertiS /S2
TRANSFORMED /S1



10

A-BLOCK /S2
BIOMEDPACK /S2
CERERE /S1
MATE4MEAT /S2
NOVISHPAK /S2
PASPACK 4.0 /S2
PLAMINPACK /S2
QuiPack /S2
SAFOOD4MED /S2
SuN4Med /S2



1

DIONYSUS /S1



	Luis Samaniego	<u>WATER4MED</u> /S2
	Hamburg University of Technology	<u>CombiFarm</u> /S2
	Forschungsverbund Berlin e.V.	<u>CYCLOLIVE</u> /S2
	University of Kassel	<u>TRANSFORMED</u> /S1
	University of Freiburg (UFR)	<u>BIOMEDPACK</u> /S2
	Berlin School of Economics and Law	<u>CERERE</u> /S1
12 Public Entities	Leibniz University Hannover (LUH)	<u>PASPACK 4.0</u> /S2
	Albstadt-Sigmaringen University	<u>PLAMINPACK</u> /S2
	Universität Hohenheim	<u>PLAMINPACK</u> /S2 <u>QuiPack</u> /S2
	Institut für Naturstoffverarbeitung INV - HdM Forschungscampus Lenningen	<u>QuiPack</u> /S2
	University of Wuerzburg	<u>SuN4Med</u> /S2
	Leibniz-Zentrum Für Agrarlandschaftsforschung (ZALF)	<u>DIONYSUS</u> /S1
	uDevelop e.V. (uDev)	<u>CIRQUA</u> /S1
	Viride Germany GmbH	<u>CombiFarm</u> /S2
6 SMEs	Computomics (COMPU)	<u>BIOMEDPACK</u> /S2
	Centre for Innovative Process Engineering (CENTIV)	<u>PASPACK 4.0</u> /S2
	Traceless materials GmbH (TraM)	<u>PASPACK 4.0</u> /S2
	Fibers365 GmbH	<u>QuiPack</u> /S2
	Institute of Food Technologies	<u>A-BLOCK</u> /S2
3 Research Foundations	Fraunhofer Institute for Process Engineering and Packaging IVV (IVV)	<u>MATE4MEAT</u> /S2
	Leibniz Institute for Agricultural Engineering & Bioeconomy	<u>NOVISHPAK</u> /S2
1 Diverse Private	WAZIUP Open Source IoT and Cloud platform	<u>Eco-FertiS</u> /S2 <u>SAFOOD4MED</u> /S2



GREECE /GR



Budget
4.15 Mln €



13 Research Units
of which **2 SME**



of which



10 Projects

involve one or more
greek Research Units

2 Projects

are coordinated by
a greek Research Unit

Projects per thematic area



2

CIRQUA /S1
SPORE-MED /S1



1

VENUS /S1



6

A-BLOCK /S2
FoWRSaP /S2
NOVISHPAK /S2
PLAMINPACK /S2
QuiPack /S2
SEEDS /S1



1

DIONYSUS /S1

Typology	Research Units	Projects <small>underline indicates coordinated project</small>
7 Public Entities	Democritus University of Thrace	CIRQUA /S1
	University of Patras (UPAT)	CIRQUA /S1
	Polytechnio Kritis (TUC)	SPORE-MED /S1
	National and Kapodistrian University of Athens	A-BLOCK /S2
	Aristotle University of Thessaloniki	FoWRSaP /S2
	University of Thessaly	QuiPack /S2 DIONYSUS /S1
	Centre for Research & Technology Hellas	SEEDS /S1
1 Association	TOEV Tavropou Karditsas (TOEV)	DIONYSUS /S1
3 Research Foundations	Ellinikos Georgikos Organismos - Dimitra	VENUS /S1 NOVISHPAK /S2
	NKUA	NOVISHPAK /S2
	University of Ioannina	PLAMINPACK /S2
2 SMEs	GRECA PESCA	NOVISHPAK /S2
	AgriTrack SA	QuiPack /S2



ISRAEL /IL



Budget
0.6 Mln €



3 Research Units



3 Projects

involve one or more
israeli Research Units

Projects per thematic area



1

Sun2Fork /S2



2

CERERE /S1
ENVOLVEPACK /S2

Typology	 Research Units	 Projects underline indicates coordinated project
2 Public Entities	Agricultural Research Organization Volcani Center (ARO)	Sun2Fork /S2
	Agricultural Research Organization	ENVOLVEPACK /S2
1 Enterprise	Nurego – General Electric Research	CERERE /S1



ITALY /IT



Budget
13.99 Mln €



46 Research Units
of which **7 SMEs**



of which



24 Projects

involve one or more
italian Research Units

9 Projects

are coordinated by
a italian Research Unit

Projects per thematic area



3

CIRQUA /S1
SPORE-MED /S1
WATER4MED2023 /S2



5

BIOACT /S2
CYCLOLIVE /S2
Sun2Fork /S2
SUPREM-MILK /S2
VENUS /S1



14

AgriBioPack/S2
BIOMEDPACK /S2
CERERE /S1
DurrInnPack /S2
FoWRsSaP /S2
INTACTBioPack /S2
MATE4MEAT /S2
PASPACK 4.0 /S2
PLAMINPACK /S2
QuiPack /S2
SAFOOD4MED /S2
SAPHIRA /S2
SEEDS /S1
STAPLES /S1



2

DIONYSUS /S1
RES-MAB /S1

Typology



Research Units



Projects

underline indicates coordinated
project

University of Basilicata (UBas)

CIRQUA /S1
PLAMINPACK /S2

Università degli Studi di Salerno (UNISA)

SPORE-MED /S1
AgriBioPack/S2

Politecnico di Bari (POLIBA)

WATER4MED2023 /S2

University of Turin (UNITO)

BIOACT /S2
CYCLOLIVE /S2
BIOMEDPACK /S2

University of Brescia (UNIBS)

BIOACT /S2

University of Tuscia (UNITUS)

BIOACT /S2

University of Florence (UNIFI)

CYCLOLIVE /S2

University of Messina (UNIME)

Sun2Fork /S2

University of Roma Tor Vergata (UniTov)

Sun2Fork /S2

Sapienza University of Rome (UNIROMA1)

SAFOOD4MED /S2

University of Bologna (Alma Mater Studiorum Università di Bologna)

SUPREM-MILK /S2

Università di Napoli Federico II (UNINA)

SUPREM-MILK /S2
MATE4MEAT /S2
PASPACK 4.0 /S2
SEEDS /S1

University of Campania "Luigi Vanvitelli" (UNICAMPANIA)

VENUS /S1

27 Public Entities

	Consiglio Nazionale delle Ricerche (CNR)	VENUS /S1
	Consorzio di Bonifica Adige Euganeo (CONSAE)	VENUS /S1
	University of Perugia (UNIPG)	AgriBioPack /S2 SAFOOD4MED /S2
	Sant'Anna School of Advanced Studies	AgriBioPack /S2
	Council for Agricultural Research and Economics, Research Centre for Cereal and Industrial Crops	CERERE /S1
	University of Milano (UNIMI)	DurrInnPack /S2
	University of Pisa (UNIP)	FoWRsAP /S2 PLAMINPACK /S2
	Produzioni Alimentari (CNR-ISPA)	INTACTBioPack /S2
	Ca' Foscari University of Venice	QuiPack /S2
	University Niccolò Cusano	SAPHIRA /S2
	Consiglio per la ricerca in agricoltura e l'analisi dell'economia agraria- Research Centre for Olive, Fruit and Citrus Crops (CREA OFA)	SAPHIRA /S2
	Politecnico di Milano (POLIMI)	STAPLES /S1
	University of Catania - Dipartimento di Agricoltura Alimentazione e Ambiente (Di3A)	DIONYSUS /S1
	Veneto Regional Park of Po Delta Authority (Po Delta)	RES-MAB /S1
2	Research Foundations	
	Slow Food International	CERERE /S1
	Collegio Carlo Alberto	STAPLES /S1
7	SMEs	
	Microbial Resources (M3R)	CIRQUA /S1
	X Team srl	AgriBioPack /S2
	CAL-TEK S.r.l.	CERERE /S1
	AlterEco Pulp Srl (AEP)	MATE4MEAT /S2
	FOSAN E.T.S, Ente di Ricerca per lo Studio degli Alimenti e della Nutrizione (FOSAN)	MATE4MEAT /S2
	ENCO SRL	SEEDS /S1
	Soc. Coop. Agroalimentare e Agroindustriale del BRADANO SPA	STAPLES /S1
2	Associations	
	ANASB Associazione Nazionale Allevatori Specie Bufalina	SUPREM-MILK /S2
	Consorzio di Tutela Arancia Rossa di Sicilia IGP (AranciaRossalGP)	DIONYSUS /S1
8	Diverse Private	
	Caudarella di Michele Russo (CDR)	VENUS /S1
	Rinci SRL (RINCI)	VENUS /S1
	Next Technology Tecnotessile	PLAMINPACK /S2
	Universitas Mercatorum (UNIM)	SAFOOD4MED /S2
	Future Food Institute ETS	SEEDS /S1
	Università di Scienze Gastronomiche di Pollenzo	STAPLES /S1
	Almaviva The Italian Innovation Company S.p.A. (Almaviva)	DIONYSUS /S1
	Istituto Oikos (OIKOS)	RES-MAB /S1



JORDAN /JO



Budget
1.32 Mln €



6 Research Units
of which **1 SME**



7 Projects

involve one or more
jordan Research Units

Projects per thematic area



1

WATER4MED /S2



2

CYCLOLIVE /S2
VENUS /S1



3

FoWRSaP /S2
SAFOOD4MED /S2
SEEDS /S1



1

RES-MAB /S1

Typology



Research Units



Project

(il nome sottolineato indica
Project coordinato)

3 Public Entities

Al-Balqa Applied University

WATER4MED /S2
SAFOOD4MED /S2

University of Jordan (UOJ)

CYCLOLIVE /S2
VENUS /S1

The Hashemite University

FoWRSaP /S2

1 Research Foundation

National Agricultural Research Center (NARC)

VENUS /S1
SEEDS /S1

1 Association

Royal Society for the Conservation of Nature (RSCN)

RES-MAB /S1

1 SME

GULF INDUSTRIAL DEVELOPMENT COMPANY, SOUTH AMMAN MILLS
LABORATORY

SEEDS /S1



LEBANON /LB



Budget
0.41 Mln €



3 Research Units



2 Projects

involve one or more
lebanese Research Units

Projects per thematic area





1

PASPACK 4.0 /S2



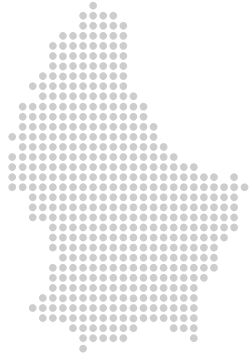
1

RES-MAB /S1

Typology	 Research Units	 Project <small>(il nome sottolineato indica Project coordinato)</small>
2 Public Entities	Lebanese University (LU)	PASPACK 4.0 /S2
	University of Balamand (UOB)	PASPACK 4.0 /S2
1 Association	American University of Beirut (AUB)	RES-MAB /S1



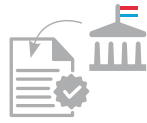
LUXEMBOURG /LU



Budget
0.50 Mln €



1 Research Unit



1 Project

involve one
luxembourg Research Unit

Projects per thematic area



1

A-BLOCK /S2

Typology

1 Public Entity



Research Units

Luxembourg Institute of Science and Technology



Project

(il nome sottolineato indica
Project coordinato)

A-BLOCK /S2



MALTA /MT



Budget
0.30 Mln €



1 Research Unit



1 Project

involve one
maltese Research Unit

Projects per thematic area



1

NOVISHPAK /S2

Typology



Research Units



Project

(il nome sottolineato indica
Project coordinato)

1 Public Entity

University of Malta

NOVISHPAK /S2



MOROCCO /MA



Budget
5.67 Mln €



31 Research Units



of which



28 Projects

involve one or more moroccan Research Units

1 Projects

are coordinated by a italian Research Unit

Projects per thematic area



4

CIRQUA /S1
Sm@wa-Medi /S2
SPORE-MED /S1
WATER4MED2023 /S2



8

3D-STELLAR /S2
CombiFarm /S2
CYCLOLIVE /S2
PAVER /S2
Sun2Fork /S2
SUPREM-MILK /S2
TRANSFORMED /S1
VENUS /S1



14

AgriBioPack /S2
BIOMEDPACK /S2
DurrInnPack /S2
EVOLVEPACK /S2
FoWRSaP /S2
NOVISHPAK /S2
PASPACK 4.0 /S2
PLAMINPACK /S2
QuiPack /S2
SAFOOD4MED /S2
SAPHIRA /S2
SEEDS /S1
STAPLES /S1
SuN4Med /S2



2

DIONYSUS /S1
RES-MAB /S1

Typology



Research Units



Project

(il nome sottolineato indica Project coordinato)

University Abdelmalek Essaâdi - Tetouan (UAET)

CIRQUA /S1

ENCG-Tanger/University Abdelmamel Essaadi

EVOLVEPACK /S2

Mohamed VI Polytechnic University (UM6P)

SPORE-MED /S1
TRANSFORMED /S1
BIOMEDPACK /S2
DIONYSUS /S1

Ibn Zohr University

WATER4MED2023
STAPLES /S1
DIONYSUS /S1

Université HASSAN II, Fsac et Fstm

3D-STELLAR /S2

Laboratoire Génie des Matériaux pour Environnement et Valorisation

3D-STELLAR /S2

Institut National de la Recherche Agronomique Morocco

CombiFarm /S2

Université Hassan Ier

CombiFarm /S2

University of Cadi Ayyad

CYCLOLIVE /S2
PLAMINPACK /S2
QuiPack /S2
SAPHIRA /S2
SuN4Med /S2

Institut National de la Recherche Agronomique Morocco (INRAM)

PAVER /S2

University Sultan Moulay Slimane (USMS)

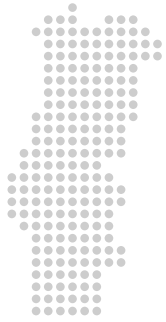
PAVER /S2
Sun2Fork /S2

19 Public Entities

	Ibn Tofail University	SUPREM-MILK /S2 SAFOOD4MED /S2
	Hassan II University of Casablanca - Faculty of Science and Technology (UH2C-FSTM)	VENUS /S1 FoWRSaP /S2
	National School of Agriculture, Meknès	AgriBioPack/S2
	Université Mohammed V de Rabat	AgriBioPack/S2 PASPACK 4.0 /S2
	Université Mohammed Premier Oujda (UMP)	DurrInnPack /S2 FoWRSaP /S2 NOVISHPAK /S2
	Technical Center of Plastics and Rubber CTPC	SAFOOD4MED /S2
	Agronomic and veterinary institute Hassan II	SEEDS /S1
	National Agency for the Development of Oases and Argan Zones (AND-ZOA)	RES-MAB /S1
5 Research Foundations	Agronomy and veterinary institute Hassan II (IAV Hassan II)	Sm@wa-Medi /S2
	National School of Applied Science, Ibn Zohr University	Sm@wa-Medi /S2
	Sultan Moulay Slimane University	CombiFarm /S2
	Centre Technique de Plasturgie et de Caoutchouc (CTPC)	PASPACK 4.0 /S2
	Advanced Science, Innovation and research	QuiPack /S2
3 Associations	Agriculture, Environment and Development for the Avenir	TRANSFORMED /S1
	Al Moutmir BU - UM6P Morocco	TRANSFORMED /S1
	El Baraka farmers association	TRANSFORMED /S1
1 Diverse Private	DAR AL CAROUBE PASPACK 4.0 /S2	TRANSFORMED /S1
3 SMEs	STE REOWA sarl (REOWA)	PAVER /S2
	WEST MAROC	TRANSFORMED /S1
	African Center for innovation in Agro-food and Cosmetics	SEEDS /S1



PORTUGAL /PT



Budget
2.05 Mln €



14 Research Units
of which **1 SME**



of which



13 Projects

involve one or more portuguese Research Units

1 Projects

are coordinated by a portuguese Research Unit

Projects per thematic area



2

CIRQUA /S1
WATER4MED2023 /S2



2

Sun2Fork /S2
TRANSFORMED /S1



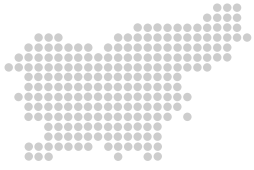
9

CERERE /S2
DurrInnPack /S2
EVOLVEPACK /S2
FoWRSaP /S2
INTACTBioPack/S2
NOVAPACK /S2
OLIVEPACK /S2
PASPACK 4.0 /S2
QuiPack /S2

Typology	Research Units	Project (il nome sottolineato indica Project coordinato)
9 Public Entities	Interdisciplinary Center for Marine and Environmental Research (CIIM)	CIRQUA /S1
	Universidade de Lisboa	WATER4MED2023 /S2
	Universidade Católica Portuguesa (UCP)	Sun2Fork /S2 EVOLVEPACK /S2
	University of Evora	TRANSFORMED /S1
	ISCTE - Instituto Universitário de Lisboa	CERERE /S2 OLIVEPACK /S2
	Instituto Politécnico de Bragança (IPB)	DurrInnPack /S2 FoWRSaP /S2
	New University of Lisbon, Institute of Chemical and Biological Technology (ITQB NOVA)	INTACTBioPack/S2
	University of Madeira	PASPACK 4.0 /S2
	Universidade de Aveiro	QuiPack /S2
1 SME	Molecule Message Unipessoal Lda (AgroGrIN Tech)	NOVAPACK /S2
1 Driver Private	Terracrua Design	TRANSFORMED /S1
1 Research Foundations	Centro de Biotecnologia e Química Fina - Universidade Católica Portuguesa	NOVAPACK /S2
1 Associations	Centro de Apoio Tecnológico Agro-Alimentar (CATAA)	PASPACK 4.0 /S2
1 Enterprise	Logoplaste (LogoP)	PASPACK 4.0 /S2



SLOVENIA /SI



Budget
0.57 Mln €



3 Research Units



3 Projects

involve one
slovene Research Unit

Projects per thematic area



1

CombiFarm /S2



1

EVOLVEPACK /S2



1

RES-MAB /S1

Typology	Research Units	Project (il nome sottolineato indica Project coordinato)
2 Public Entities	Public Institute Park Skocjan Caves (PSJ)	RES-MAB /S1
	University of Ljubljana	CombiFarm /S2
1 Driver Private	Pulp and Paper Institute	EVOLVEPACK /S2



SPAIN /ES



Budget
9.68 Mln €



40 Research Units
of which **4 SMEs**



of which



26 Projects

involve one or more
spanish Research Units

6 Projects

are coordinated by
a spanish Research Unit

Projects per thematic area



4

CIRQUA /S1
Sm@wa-Medi /S2
SPORE-MED /S1
WATER4MED2023 /S2



7

BIOACT /S2
CYCLOLIVE /S2
PAVER /S2
Sun2Fork /S2
SUPREM-MILK /S2
TRANSFORMED /S1
VENUS /S1



14

AgriBioPack/S2
BIOMEDPACK /S2
DurrInnPack /S2
EVOLVEPACK /S2
FoWRSaP /S2
INTACTBioPack /S2
MATE4MEAT /S2
NOVAPACK /S2
OLIVEPACK /S2
QuiPack /S2
SAPHIRA /S2
SEEDS /S1
STAPLES /S1
SuN4Med /S2



1

RES-MAB /S1

Typology



Research Units



Project
(il nome sottolineato indica
Project coordinato)

Universidad Carlos III de Madrid (UC3M)

CIRQUA /S1

Consejo Superior de Investigaciones Científicas (CSIC)

WATER4MED2023 /S2
EVOLVEPACK /S2
DurrInnPack /S2

Universitat Jaume I Castellón

BIOACT /S2

Spanish National Research Council

CYCLOLIVE /S2

Universitat Politècnica de Valencia (UPV)

PAVER /S2

Universitat Politècnica de Cartagena (UPCT)

PAVER /S2

Universidad de Almería (UAL)

Sun2Fork /S2

University of Girona (UdG)

SPORE-MED /S1

Universidad de León

TRANSFORMED /S1

Lleida University

AgriBioPack/S2

University of Granada

Facultad de Ciencias - Departamen-
to de Química Analítica

AgriBioPack/S2

SAPHIRA /S2

Universidad de Córdoba (UCO)

BIOMEDPACK /S2
DurrInnPack /S2

22 Public Entities

	Centro Tecnológico da Carne	FoWRSaP /S2
	Miguel Hernández University	FoWRSaP /S2
	Institute of Agrochemistry and Food Technology, Spanish National Research Council (IATA-CSIC)	INTACTBioPack /S2
	Universitat Jaume I (UJI)	MATE4MEAT /S2
	University of Extremadura (UEX)	OLIVEPACK /S2
	University of Vic-Central University of catalonia	QuiPack /S2
	Universidad de Alicante	SAPHIRA /S2
	University of Oviedo	SuN4Med /S2
	Forest Science and Technology Centre of Catalonia (CERCA)	RES-MAB /S1
	Alto Bernesga Biosphere Reserve Foundation (Alto Bernesga)	RES-MAB /S1
4 Associations	Asociación para la investigación de la industria del Juguete, conexas y afines	SUPREM-MILK /S2
	National Technological Centre for the Food and Canning Industry	NOVAPACK /S2
	Euro-Mediterranean Economists Association	STAPLES /S1
	Association of the Mediterranean Chambers of Commerce and Industry	STAPLES /S1
6 Diverse Privates	Fundació Universitària Balmes	TRANSFORMED /S1
	Idener Research & Development AIE (IDENER)	VENUS /S1
	TECSELOR	EVOLVEPACK /S2
	Technological institute of Plastic	NOVAPACK /S2
	Technological Centre, Packaging, Transport and Logistics	SEEDS /S1
	Centro Nacional de Tecnología y Seguridad Alimentaria	SEEDS /S1
2 Enterprise	ADASA Sistemas, S.A.U. (ADASA)	SPORE-MED /S1
	GS INIMA Environment (INIMA)	SPORE-MED /S1
2 Research Foundations	Instituto regional de investigación Científica Aplicada	Sm@wa-Medi /S2
	Instituto Tecnológico de Castilla y León, ICTL	SuN4Med /S2
4 SMEs	PackBenefit S.L. (PB)	BIOMEDPACK /S2
	SURINVER S. COOP	FoWRSaP /S2
	EVERSIA SA	NOVAPACK /S2
	Iberfruta Muerza S.A.	SuN4Med /S2



TUNISIA /TN



Budget
4.30 Mln €



33 Research Units
of which **5 SMEs**



of which



26 Projects

involve one or more
tunisian Research Units

3 Projects

are coordinated by
a tunisian Research Unit

Projects per thematic area



4

CIRQUA /S1
Sm@wa-Medi /S2
SPORE-MED /S1
WATER4MED2023 /S2



7

3D-STELLAR /S2
BIOACT /S2
CombiFarm /S2
CYCLOLIVE /S2
Eco-FertiS /S2
TRANSFORMED /S1
VENUS /S1



14

BIOMEDPACK /S2
CERERE /S1
DurrInnPack /S2
FoWRSaP /S2
INTACTBioPack /S2
NOVAPACK /S2
NOVISHPAK /S2
OLIVEPACK /S2
PASPACK 4.0 /S2
PLAMINPACK /S2
QuiPack /S2
SAPHIRA /S2
SEEDS /S1
SuN4Med /S2



1

DIONYSUS /S1

Typology



Research Units



Project
(il nome sottolineato indica
Project coordinato)

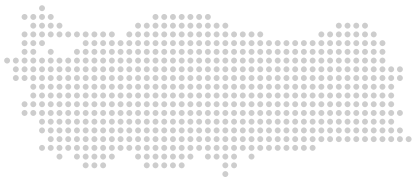
University of Manouba (UMA)	CIRQUA /S1
Agence de la vulgarisation et de la formation agricoles Tunisie	Sm@wa-Medi /S2
University of Sfax (USF)	SPORE-MED /S1
Laboratoire de recherche Sciences et technologies des eaux (LRSTE)	WATER4MED2023 /S2
Laboratory of Water, Energy and Environment, Sfax National School of Engineers	3D-STELLAR /S2
Université de Sfax	CYCLOLIVE /S2 BIOMEDPACK /S2 OLIVEPACK /S2 PLAMINPACK /S2
ENIS	SuN4Med /S2
Center of Biotechnology of Sfax	3D-STELLAR /S2
INRAT - Agricultural Research Establishment	CombiFarm /S2
Centre des Recherches et des Technologies des Eaux	CombiFarm /S2
Institut National de la Recherche en Génie Rural, Eaux et Forêts (INRGREF)	Eco-FertiS /S2 VENUS /S1
Technical Center of Organic Ariculture	TRANSFORMED /S1
Institute of Technological Studies of Ksar Hellal (ISETKH)	DurrInnPack /S2

21 Public Entities

	Center of Biotechnology of Borj Cédri (CBBC)	FoWRSaP /S2
	National Center for Nuclear Sciences and Technologies	FoWRSaP /S2
	Centre Technique de l'Emballage et du Conditionnement-PackTec	INTACTBioPack /S2
	Institut National Agronomique de Tunisie (INAT)	INTACTBioPack /S2
	ISBA Medenine Gabed university	NOVAPACK /S2
		NOVISHPAK /S2
	Université de Tunis El Manar	Laboratoire de recherche en Informatique, Modélisation et Traitement de l'Information et de la Connaissance (LIMTIC), Institut Supérieur d'Informatique SAPHIRA /S2
	National Institute of Research and Physicochemical Analysis (INRAP)	PASPACK 4.0 /S2
	Centre of Biotechnology of Borj Cedria	QuiPack /S2
	National institute for Agricultural Research Tunisia (INRAT)	SEEDS /S1 DIONYSUS /S1
	ISSAT, University of Gabes	SuN4Med /S2
7 SMEs	African Biotechnology Company (ABC)	CIRQUA /S1
	TELCOTEC	Sm@wa-Medi /S2
	SQLI Services Tunisia	CERERE /S1
	Boudjebel SA VACPA	FoWRSaP /S2
	Sté AGRI-LAND	FoWRSaP /S2
	Zina Fresh Company Gabes	NOVAPACK /S2
	COMPTOIR MULTISERVICES AGRICOLE, ROSE BLANCHE	SEEDS /S1
5 Research Foundations	University of Carthage, higher Institute of Environmental Sciences and Technologies (UCAR)	Sm@wa-Medi /S2
	Faculty of Sciences Sfax	Sm@wa-Medi /S2
	National Center of research in Materials Science Borj Cedria	Sm@wa-Medi /S2
	International Center for Africultural Research in the Dry Areas	TRANSFORMED /S1
	National Institute of Field Crops	SEEDS /S1



TURKEY /TR



Budget
2.83 Mln €



28 Research Units
of which **4 SMEs**



of which



21 Projects

involve one or more
turkish Research Units

1 Project

is coordinated by
a turkish Research Unit

Projects per thematic area



1

CIRQUA /S1



6

CombiFarm /S2
CYCLOLIVE /S2
Eco-FertiS /S2
Sun2Fork /S2
SUPREM-MILK /S2
TRANSFORMED /S1



13

A-BLOCK /S2
AgriBioPack /S2
BIOMEDPACK /S2
CERERE /S1
EVOLVEPACK /S2
FoWRsSaP /S2
INTACTBioPack /S2
MATE4MEAT /S2
OLIVEPACK /S2
PASPACK 4.0 /S2
QuiPack /S2
SAPHIRA /S2
SuN4Med /S2



1

DIONYSUS /S1

Typology



Research Units



Project

(il nome sottolineato indica
Project coordinato)

Istanbul University

CIRQUA /S1

Eskisehir Technical University

CombiFarm /S2

Ege University

Sun2Fork /S2
AgriBioPack /S2

Istanbul Üniv. Cerrahpaşa Avcılar Kampüsü

SUPREM-MILK /S2

Ankara University

SUPREM-MILK /S2
MATE4MEAT /S2

Istanbul Bilgi University

A-BLOCK /S2

Istanbul Technical University

AgriBioPack /S2

16 Public Entities

Field Crops Central Research Institute, Ministry of Agriculture and Forestry

CERERE /S1

Tarsus University (TU)

EVOLVEPACK /S2
FoWRsSaP /S2
INTACTBioPack /S2

Middle East Technical University

FoWRsSaP /S2

Yörüksüt A.Ş. (YORUK)

INTACTBioPack /S2

Sabancı University Nanotechnology Research and Application Center

OLIVEPACK /S2

Bornova Olive Research Institute (ORI)

OLIVEPACK /S2

University of Cukurova (CUNI)

PASPACK 4.0 /S2

	Atatürk Üniversitesi, Fisheries Faculty	QuiPack /S2
	Süleyman Demirel University	SuN4Med /S2
1 Research Units	Bahri Dagdas International Agricultural Research Institute	TRANSFORMED /S1
2 Association	International Association For Resilience & Trauma Counseling (IARTC)	Eco-FertiS /S2
	Nature Conservation Centre Foundation (DKM) - Doga Koruma Merkezi	TRANSFORMED /S1
4 SMEs	Geobilgi Bilisim Tecknolojileri	CombiFarm /S2
	MetaMeta Anatolia	CYCLOLIVE /S2 SAPHIRA /S2
	GTE Sustainability and Energy Consultancy (GTE)	BIOMEDPACK /S2 MATE4MEAT /S2
	Teknopak Plastik San. Ve Tic. Ltd. Sti.	SuN4Med /S2
5 Divers Private	Ülker Bisküvi	A-BLOCK /S2
	Polinas Plastic Company	A-BLOCK /S2
	Yeditepe University	AgriBioPack /S2
	Camusfish su ürünleri san. Ve tic. Ltd. Sti	EVOLVEPACK /S2
	Olive Oil Academy (OOA)	OLIVEPACK /S2

Funded Project 2023





Project factsheets

Section 1 /S1

Project factsheets follow the order by Thematic Area
(Water management; Farming Systems; Agri-food Value Chain; Nexus)



CIRQUA /S1
SPORE-MED /S1



TRANSFORMED /S1
VENUS /S1



CERERE /S1
SEEDS /S1
STAPLES /S1



DIONYSUS /S1
RES-MAB /S1

Thematic Area

Water Management



Action and Topic

IA - Innovation Action



Budget

4.270.000,00 €



Duration

36 months



State and Coordinator Entity

GREECE

Democritus University of Thrace



Scientific Coordinator:
NTOUGIAS, Spyridon

Participating States/ 10



Research Units/ 13



Section 1

CIRQUA

Integrated Approaches at Local Scale for Enhancing Water Reuse Efficiency and Sustainable Soil Fertilization from Wastewater's Recovered Nutrients

Context

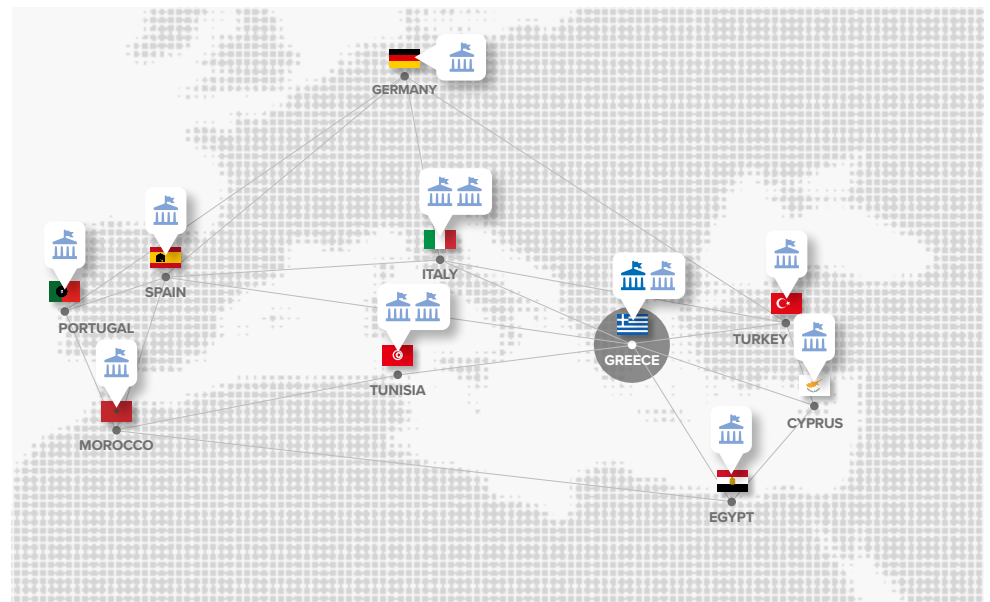
The sustainable solutions proposed by CIRQUA can be widely-used, they are safe, decentralized, easy to operate and environmentally-friendly. They can help meet the strict legislative EU requirements, increasing water efficiency and conserving water resources in the Mediterranean region, advancing resilience in view of Climate Change challenges. They can also valorize non-conventional nutrient resources for precision irrigation and fertilization, which is a pillar of sustainable agriculture.

Objective and contents

CIRQUA objectives are to: i) develop innovative nanomaterials and photocatalysts for constructing innovative filters for efficient water reclamation; ii) design, construct and test innovative Constructed Wetlands-CWs for enhanced wastewater reuse by adopting these innovative filters and photocatalytic modules; iii) provide a new decentralized approach through Industry 4.0 to improve water quality; iv) produce biomass-derived nanostructured fertilizers and valorize the treated effluent of these CWs for soil fertilization, aiming at improving plant growth and health as well as soil organic matter properties and fertility; v) test CIRQUA technologies under field conditions; vi) develop new Agriculture 4.0 algorithms for precision irrigation and fertilization; vii) evaluate CIRQUA technologies through environmental and socioeconomic assessment, and viii) efficiently communicate CIRQUA technologies to the relevant stakeholders and audience to adopt these new Nature-Based Solutions.

Expected impacts and results

The expected results and impact of the project are an increase in cross-border contacts and social initiatives regarding water and soil management, resource-saving innovation in agriculture, reduced environmental footprint in terms of water efficiency estimation, field evaluation of nanostructured fertilizer, development of precision agriculture models, and enhanced soil fertility from non-conventional resources. The project aims to increase water efficiency and quality, promote sustainable water management, and engage local com-



Other in Consortium/ 12

University of Patras (UPAT) - GR
Monitoring and Management of
Microbial Resources (M3R) - IT

University of Basilicata (UBas) - IT

University of Manouba (UMA) - TN

African Biotechnology Company
(ABC) - TN

University of Cyprus (UCY) - CY

Ain Shams University (ASU) - EG

uDevelop e.V. (uDev)- DE

University Abdelmalek Essaâdi-
Tetouan (UAET) - MA

Interdisciplinary Center for Marine
and Environmental Research
(CIIM) - PT

Universidad Carlos III de Madrid
(UC3M) - ES

Istanbul University (IU) - TR

munities in environmental initiatives. In summary, the project's comprehensive approach will not only address immediate agricultural challenges, but will also contribute to broader environmental and social benefits.

Keywords

#water_reclamation_and_reuse

#water_quality

#bionanofertilizer

#precision_irrigation

#nature_based_solutions

#soil_fertilization

#soil_improvement

Demo sites/case studies

4 

New products and solutions:

✔ Upgrading constructed wetlands



Thematic Area

Water Management



Action and Topic

IA - Innovation Action



Budget

3.630.284,00 €



Duration

36 months



State and Coordinator Entity

SPAIN

University of Girona (UdG)



Scientific Coordinator:
COLPRIM GALCERAN, Jesús

Participating States/ 7



Research Units/ 9



Section 1

SPORE-MED

Sustainable upgrades WWTPs for resource recovery, water reuse and health surveillance in the Mediterranean region

Context

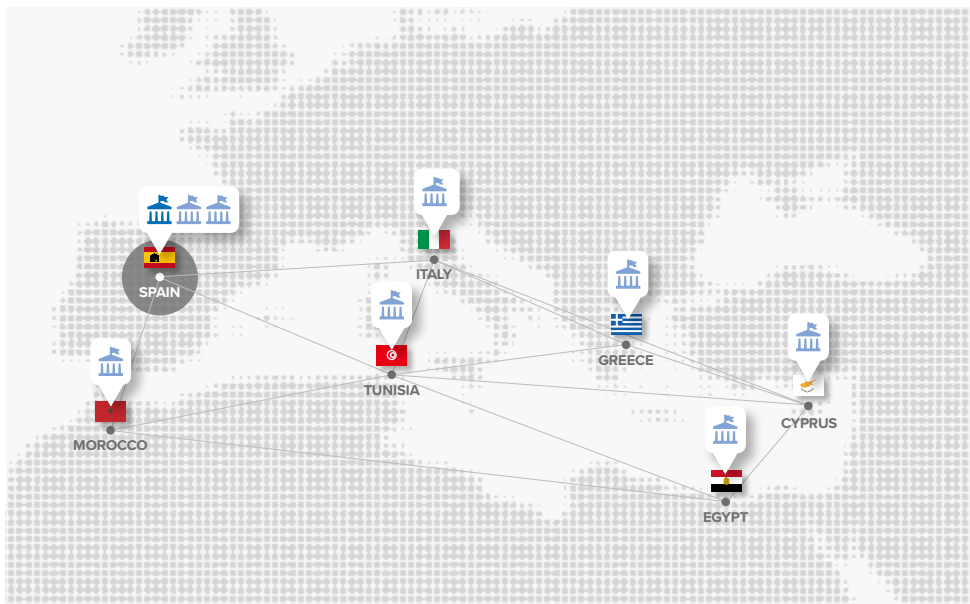
The progress made in sanitation shows significant disparities. While many household wastewater flows are still not treated, existing utilities face up challenges posed by climate change, water scarcity, increasing population, soaring energy prices, and emerging pollutants. This underscores the need to build and upgrade urban wastewater treatment plants with more sustainable technologies that are not only able to treat water but also provide us with valuable resources, goods, and services.

Objective and contents

SPORE-MED will upscale a set of innovative physicochemical and biological wastewater treatment technologies, ITC tools, and protocols, at TRL6-8. The ultimate goals are to i) optimize energy and nutrient management, ii) increase wastewater reuse for irrigation, iii) steer digital transformation in the water sector, iv) remove more micro-plastics and micro-pollutants, and v) establish a wastewater-based health surveillance system for pathogens and antimicrobial resistance. The work plan includes sampling, prototyping, and validation-demonstration activities in urban wastewater treatment plants in Spain, Italy, Cyprus, Greece, and Tunisia. Moreover, irrigation with wastewater and fertilization with recovered nutrients will be studied in field/greenhouse trials in Morocco. In parallel, the environmental, economic and societal sustainability of the proposed solutions systems will be determined by life cycle assessment, life cycle costing methodologies, and social network analysis.

Expected impacts and results

The upscale of SPORE-MED technologies and concepts has a high potential to create new market opportunities in the water, agricultural, and healthcare sectors in the Mediterranean, while moving urban wastewater treatment plants towards energy and



Other in Consortium/ 8

ADASA Sistemas, S.A.U. (ADASA)
- ES

GS INIMA Environment (INIMA) -
ES

University of Cyprus (UCY) - CY

Cairo University (CUN) - EG

Polytechnio Kritis (TUC) - GR

Università degli Studi di Salerno
(UNISA) - IT

University Mohamed VI
Polytechnic (UM6P) - MA

University of Sfax (USF) - TN

carbon neutrality and reducing nutrient and micro-plastics/pollutants in water bodies. At the societal level, SPORE-MED will advance the circular economy paradigm, promoting not only cutting-edge technologies but also public openness towards reuse solutions. This will have positive impacts on human health and wellbeing, by improving water quality, water-based epidemiology (monitoring of antimicrobial resistance and SARS-COV-2), and the sustainability and climate resilience of water treatment and agriculture.

Keywords

#wastewater_treatment

#nutrient_recovery

#water_reuse

#wastewater-based_health_surveillance_system

micro-plastics

#digital_solutions

#sustainability_assessment

#water-energy-food-health_nexus



Demo sites/case studies

6 

New products and solutions:

- ✓ low energy wastewater treatment system PROGRAMOX®;
- ✓ froth flotation-based on air nanobubbles for micro-plastics removal;
- ✓ living membrane bioreactor for micro-pollutants and micro-plastics removal;
- ✓ struvite for fertilizers;
- ✓ phosphate and nitrate sensors;
- ✓ PANI sensors to detect SARS-COV2;
- ✓ microbiological parameters sensor;
- ✓ antimicrobial resistance surveillance protocols



Thematic Area

Farming Systems



Action and Topic

IA - Innovation Action



Budget

4.132.500,00 €



Duration

36 months



State and Coordinator Entity

SPAIN

Fundació Universitària
Balmes



Scientific Coordinator:
ARMENGOT, Laura

Participating States/ 7



Research Units/ 16



Section 1

TRANSFORMED

Transforming the mediterranean region through agroforestry: large scale restoration of degraded lands by overcoming the socioeconomic and sociocultural barriers for agroforestry adoption

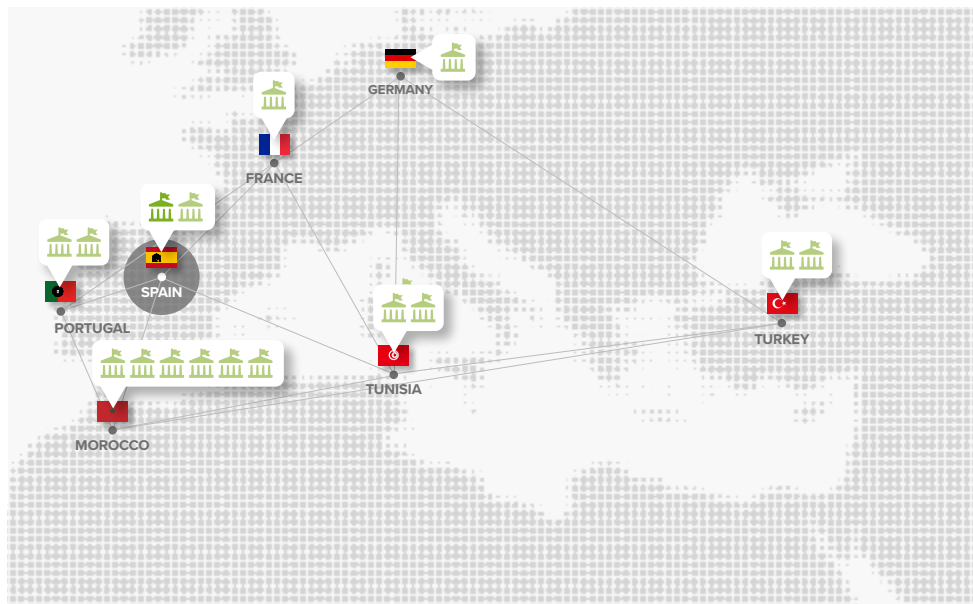
Context

The consortium of TRANSFORMED is unique for the strength, complementarity and interdisciplinarity of its consortium. Previous work of the consortium has provided solid background on the adoption constraints of AFS but also on the best suitable approaches to overcome them. These experiences are essential for designing a project with the ambition of having impact not only on the selected regions but also on a larger scale.

TRANSFORMED is completely aligned with the scope of PRIMA 1.2.1-2023 and, in addition to the expected mentioned impacts, it will contribute to climate change mitigation and adaptation, create new market opportunities and promote traditional crops and culture.

Objective and contents

The overall objective of TRANSFORMED is to support and promote a large scale implementation of successful agroforestry systems (AFS) in saline and highly soil degraded areas as a tool to restore soil health and increase biodiversity and productivity of the agroecosystems by overcoming the identified barriers for adaption. TRANSFORMED is designed with the premise that previous research and technological advances made by both researchers and practitioners have evidenced that certain AFS crops and designs are successful cost-effective tools for soil restoration in highly degraded areas. However, a large-scale up adoption will only occur when the main socio-cultural, -economic, and -political barriers are considered in the restoration strategies. TRANSFORMED brings together social and environmental scientist, agronomist and economist, practitioners, private sector, decision and policy makers, governmental national agencies and civil society in a multidisciplinary and multi-actor environment, to create an enabling context for AFS adoption.



Other in Consortium/ 15

Universidad de León (ULE) - ES
AGriculture, ENvironment and
Development for the Avenir
(AGENDA) - MA

AL Moutmir BU - (UM6P) - MA

DAR AL CAROUBE - MA

Societe L'ouest Marocain (SOM) -
MR

El Baraka farmers association - MA

University Mohammed VI

Polytechnic (UM6P BU) - MR

University of Évora (UÉvora) - PT

Terracrua Design – PT

International Center for Africultural
Research in the Dry Areas
(ICARDA) - TN

Technical Center of Organic
Agriculture (CTAB) - TN

Bahri Dagdas International
Agricultural Research Institute
(BDIARI) - TR

Nature Conservation Centre
Foundation - Doga Koruma
Merkezi Vakfi (DKM) - TR

Research Institute for Organic
Agriculture (FiBL) - FR

University of Kassel (UK) - DE

Expected impacts and results

TRANSFORMED has identified 4 successful AFS restoration experiences, lighthouses, in Morocco (Oulad Bou Said/Oulad Jdi Commune, and Lahyatla, Oulad mrabet commune), Tunisia (Sbaihia site), and Türkiye (Konya/Sarayönü): carob AFS, argan AFS, sylvopastoral system and multilayer AFS for wind-erosion protection. TRANSFORMED will promote and adapt these experiences to 11 new different regions, including saline, wind-eroded and highly degraded land, i.e., Sebt Oulad Bour Hadi Sebt Jahjouhe and Lahyatla, Oulad mrabet, Ben Guerir in Morocco, Konya (Cihanbeyli, Ereğli.), Kırşehir (Çiçekdağı) in Türkiye and Zaghouan and Sousse in Tunisia. TRANSFORMED will promote the use of more than native and traditional plants, some of them with high economical value and with high potential for value chain development. In addition, the successful AFS restoration in Montado (Portugal) will be the lighthouse for policies (result-based models) and used as one of the planned activities for south-north and north-south learning exchange.



Thematic Area

Farming Systems



Action and Topic

IA - Innovation Action



Budget

4.562.857,00€



Duration

36 months



State and Coordinator Entity

GREECE

Ellinikos Georgikos Organismos
- Dimitra



Scientific Coordinator:
ASCHONITIS, Vassilis

Participating States/ 8



Research Units/ 13



Section 1

VENUS

Converting marginal lands of the mediterranean basin into productive and sustainable agro-ecosystems using low water demanding neglected and underutilized species

Context

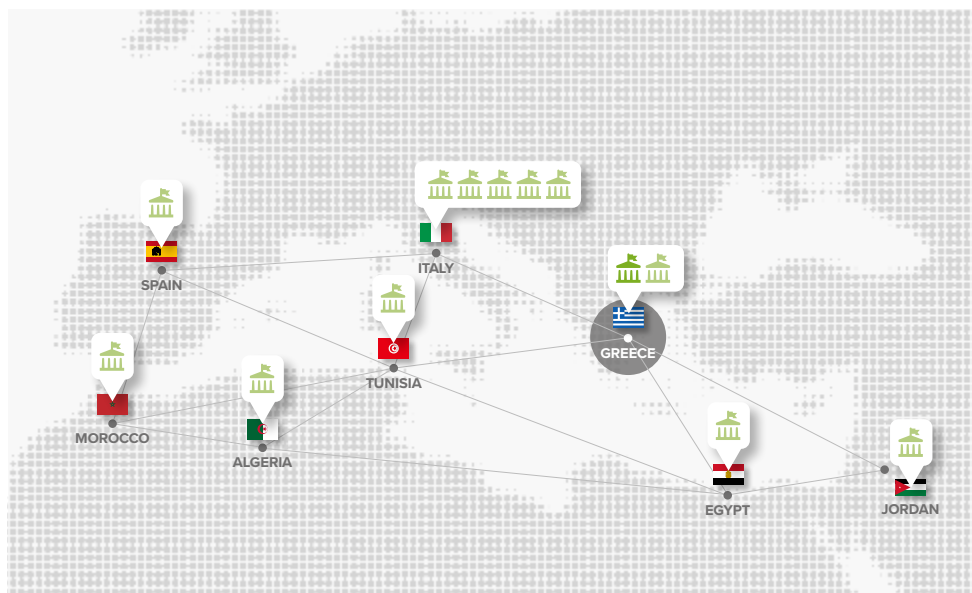
Desertification and freshwater availability are the most limiting factors for agricultural production in the Mediterranean basin. Neglected and underutilized species (NUS) that are more tolerant to water shortage and able to grow in marginal lands subjected to desertification can induce a positive shift in the soil water balance and carbon storage. NUS could represent a valid alternative for farmers, in particular small holders, to produce economic value converting marginal or low productivity soils to productive ones

Objective and contents

The VENUS project aims at demonstrating the environmental and economic potential of introducing low water demanding NUS adapted to grow in dry conditions, often in combination with other limiting factors like high salinity or reduced nutrient inputs. The specific objectives of the project are: 1) to provide knowledge-based evidence of environmental and economic benefits of NUS cultivation; 2) to set up 11 demonstration sites in different Mediterranean countries (Greece, Italy, Jordan, Morocco, Tunisia, Egypt, Algeria) already affected or forecasted to be increasingly affected by land degradation; 3) to transfer knowledge on how to exploit NUS crops at best, assisting farmers in entering Living Labs and markets to promote their products; 4) to assess the environmental, social and economic scalability of the NUS cultivation at country scale; 5) to raise awareness of the benefits derived by the introduction of NUS crops among farmers, public authorities and food industries.

Expected impacts and results

The project will demonstrate the economic and environmental potential of introducing 10 NUS through 11 pilot sites with 4 associated best management practices (intercropping, cropping under high salinity conditions, cover cropping, combined with honey production). The scalability and transferability of NUS production systems will be reached by using suitability maps and a decision support system (DSS) taking into account current and future climate scenarios. The project will promote the benefits



Other in Consortium/ 12

University of Campania “Luigi Vanvitelli” (UNICAMPANIA) - IT

Consiglio Nazionale delle Ricerche (CNR) - IT

Consorzio di Bonifica Adige Euganeo (CONSAE) - IT

Rinci SRL (RINCI) - IT

Caudarella di Michele Russo (CDR) - IT

National Agricultural Research Center (NARC) - JO

University of Jordan (UOJ) - JO

Participatory Development Solutions – EIMahrousa PDS - EG

University of Science and Technology Houari Boumediene (USTHB) - DZ

Hassan II University of Casablanca - Faculty of Science and Technology (UH2C-FSTM) - MA

Idener Research & Development AIE (IDENER) - ES

Institut National de la Recherche en Génie Rural, Eaux et Forêts (INRGREF) - TN

from the NUS agricultural systems among farmers and their associations, processors, retailers, practitioners, researchers and policy makers through business models, Living Labs establishment, policy initiative briefs and networking through the VE-NUS network platform.

Keywords

#Neglected_and_underutilized_species

#soil_health

#desertification

#Living_Labs

#best_management_practices

#business_models

#decision_support_system

#suitability_maps

#network_platform



Demo sites/case studies

11

Platforms / Hub

1

New products and solutions:

- ✓ intercropping with NUS plants;
- ✓ NUS cover cropping;
- ✓ NUS cultivation under high salinity conditions;



Thematic Area

Agri-food Value Chain



Action and Topic

RIA - Research and Innovation Action



Budget

2.750.000,00 €



Duration

36 months



State and Coordinator Entity

ITALY

University of Calabria (UNICAL)



Scientific Coordinator:
PADOVANO, Antonio

Participating States/ 7



Research Units/ 10



Section 1

CERERE

CEreals REsilieny REvolution for agile supply chain management in the Mediterranean

Context

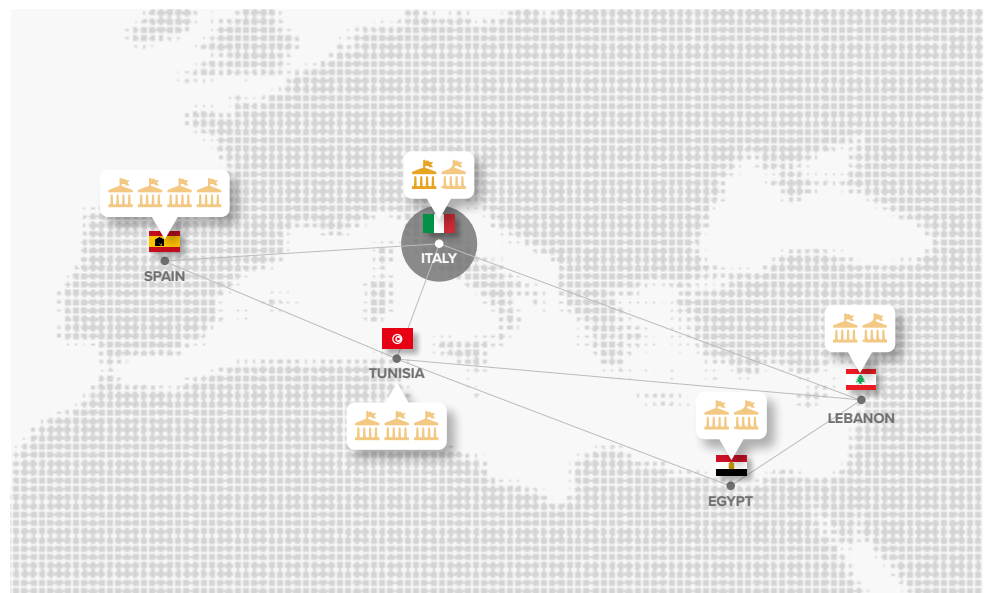
Climate change, the COVID-19 pandemic, and geopolitical events have exposed the vulnerability of Mediterranean food systems, leading to a more resilient supply chains. In this context, many rural agri-food economies, especially in MENA countries, struggle, among all, due to low incomes, unfavorable environmental conditions, and inefficient practices, affecting their livelihoods and land conditions. Food organizations need to consider novel options and adopt a comprehensive strategy to build resilience and ensure the viability of their businesses and cereal SCs.

Objective and contents

CERERE's objective is to contribute to enhance the resilience and viability of the cereal intertwined supply network (C-ISN) and local food systems in MENA countries (and, by large, in the Mediterranean area) through a combined, cross-cutting approach of basic research, industrial research, technological development, social/business innovation, and capacity building. Four specific objectives (SO) will be achieved: - To map and assess the resilience and viability of the C-ISN to identify critical dependencies between actors and detect, analyse, and predict vulnerabilities. - To design and develop an intelligent nerve centre to be used for resilient network design space exploration via experimentation and for the agile orchestration of the C-ISN. - To cultivate a Mediterranean resilience-minded culture and localized experiences for creating fertile socio-cultural soil for future disruption-proof C-ISNs. - To derive a list of good practices and evidence-based recommendations for organisations and policy-makers for viable and resilient agri-food ISNs.

Expected impacts and results

CERERE contributes to generate the following impacts: - Increase understanding, transparency and predictability of cereal SC performance - Promote a risk-based



Other in Consortium/ 9

CAL-TEK S.r.l. - IT

Council for Agricultural Research and Economics, Research Centre for Cereal and Industrial Crops - IT

Slow Food International - IT

The American University in Cairo - EG

Berlin School of Economics and Law - DE

Nurego – General Electric Research - IL

ISCTE-Instituto Universitário de Lisboa - PT

SQLI Services Tunisia - TN

Field Crops Central Research Institute, Ministry of Agriculture and Forestry - TR

approach to cereals SC management - Promote successful management practices in local food environments in the MENA region - Promote an agile cereal SC management in the Mediterranean area - Reduce uncertainty in SC risk management and enable mitigation capability to SC actors - Accelerate technology and innovation uptake by smallholders and farmers to gain competitive advantage and achieve better performance

Keywords

#Supply_chain_resilience_and_viability

#digital_twin

#sustainable_food_systems

#agile_supply_chain

#cognitive_human_interface

#intelligent_operations

smart_agriculture

Demo sites/case studies

2 



Platforms / Hub

1 

New products and solutions:

- ✓ Intelligent nerve centre to be used for resilient network design space exploration via experimentation and for the agile orchestration of the cereal ISN



Thematic Area

Agri-food Value Chain



Action and Topic

IA - Innovation Action



Budget

2.748.875,00 €



Duration

36 months



State and Coordinator Entity

ITALY

ENCO SRL



Scientific Coordinator:
OEZMUTLU, Oezlem

Participating States/ 7



Research Units/ 16



Section 1

SEEDS

Sustaining Economies and Enhancing Dynamic Structures

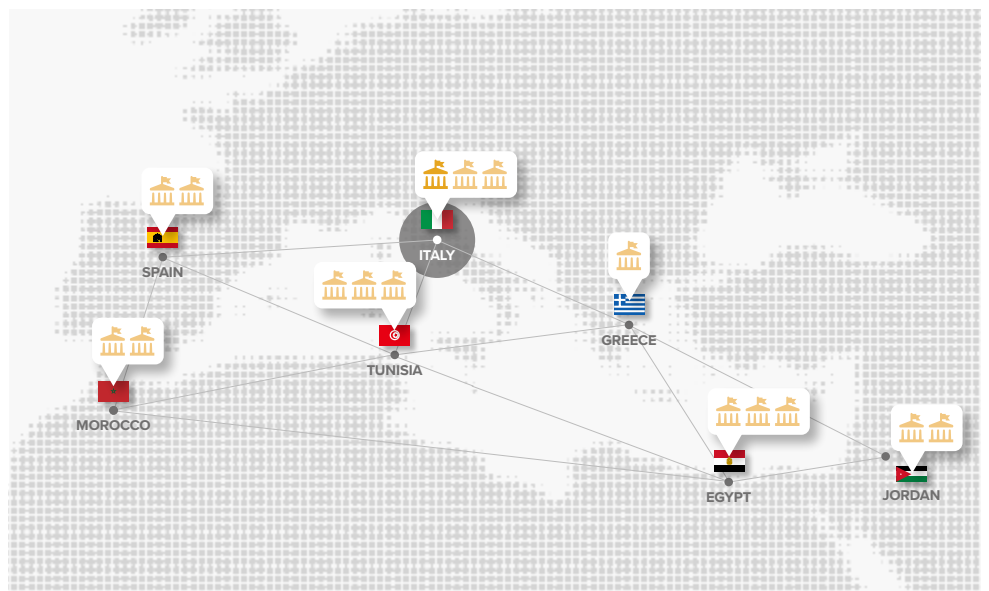
Objective and contents

The SEEDS project aims to strengthen the resilience of the agro-food supply chain for cereals in the MENA region and to revive the use of ancient grains by testing their adaptability to current climatic conditions, pests, and diseases. This overarching goal will be pursued by evaluating and co-developing evidence-based recommendations to enhance the resilience of the supply chain and digitize it through a user-centered platform in four MENA countries: Tunisia, Egypt, Morocco, and Jordan.

Objective and contents

SEEDS will provide strategies and best practices on how to use ancient grains to strengthen the resilience of local value chains, create synergies between stakeholders, digitize the supply chain, and create alerts in case of shocks that could disrupt the cereal sector. SEEDS will employ a multi-criteria analysis to evaluate and co-develop evidence-based recommendations through an intervention design toolkit aimed at enhancing supply chain resilience. This will help ensure that supply chains are resistant to external shocks and that value chain structures are digitized to improve efficiency and transparency.

Additionally, SEEDS will use living labs to evaluate and build best practices and evidence-based recommendations, drawing on prior knowledge and experiences by involving local communities, farmers, businesses, and other stakeholders. These living labs will also define the cereal value chain network in each country, construct the AKIS model to improve knowledge transfer among different stakeholders, and foster innovative solutions that can withstand external shocks, supporting the development of local food systems with healthier and more sustainable options for this staple crop. The project aims to implement a user-friendly, accessible, and inclusive digital platform for crop monitoring, using Copernicus/local data, sensors in the market to monitor temperature, humidity, and gases such as methane, CO₂, N₂, etc. These sensors will provide valuable information on climatic conditions, and could also be integrated with weather forecasts, Meteostat, and others. This will create an intelligent supply



Other in Consortium/ 15

Future Food Institute ETS - IT

**Università degli studi di Napoli
FEDERICO II (UNINA) - IT**

Healthtech - EG

Agricultural Research Center - EG

**Confederation of Egyptian
European Business Associations
- EG**

**Comptoir Multiservices Agricole,
Rose Blanche (CMA) - TN**

**National institute for Agricultural
Research Tunisia (INRAT) - TN**

**National Institute of Field Crops -
TN**

**Gulf Industrial Development
Company, South Amman Mills
Laboratory - (GIDC) - JO**

**National Agricultural Research
Center - JO**

**African Center for innovation in
Agro-food and Cosmetics - MA**

**Agronomic and veterinary institute
Hassan II - MA**

**Centro Nacional de Tecnología y
Seguridad Alimentaria - ES**

**Technological Centre, Packaging,
Transport and Logistics - ES**

**Centre for Research & Technology
Hellas - GR**

chain where stakeholders can efficiently interconnect, and the AKIS model will be replicated in Southern Mediterranean countries to improve knowledge sharing and digitize it via a user-friendly platform.

Expected impacts and results

SEEDS is a high-impact project with a transdisciplinary approach aimed at mapping cereal value and supply chains, identifying shocks, assessing risks, and implementing interventions at macro, meso, and micro levels to strengthen the baseline of cereal supply chains. It will leverage 4 living labs (LL) that engage stakeholders in the cereal sector to increase resilience, include end-users in the development, implementation, and validation of solutions, and validate at least 2 ancient grains per country for their resilience to current climate conditions, pests, and diseases, utilizing these grains to enhance local food systems.

SEEDS aligns with PRIMA SRIA's operational objective 4 (smart and sustainable agriculture) and operational objective 8 (new agro-food business models), as well as research priorities in the region. The project aims to promote sustainable solutions while involving local communities to create more resilient and adaptive food environments.



Thematic Area

Agri-food Value Chain



Action and Topic

RIA - Research and Innovation Action



Budget

2.692.925,00 €



Duration

36 months



State and Coordinator Entity

ITALY

Politecnico di Milano (POLIMI)



**POLITECNICO
MILANO 1863**

Scientific Coordinator:
CANIATO, Federico

Participating States/ 4



Research Units/ 9



Section 1

STAPLES

Stable food Access and Prices and Lower Exposure to Shocks

Context

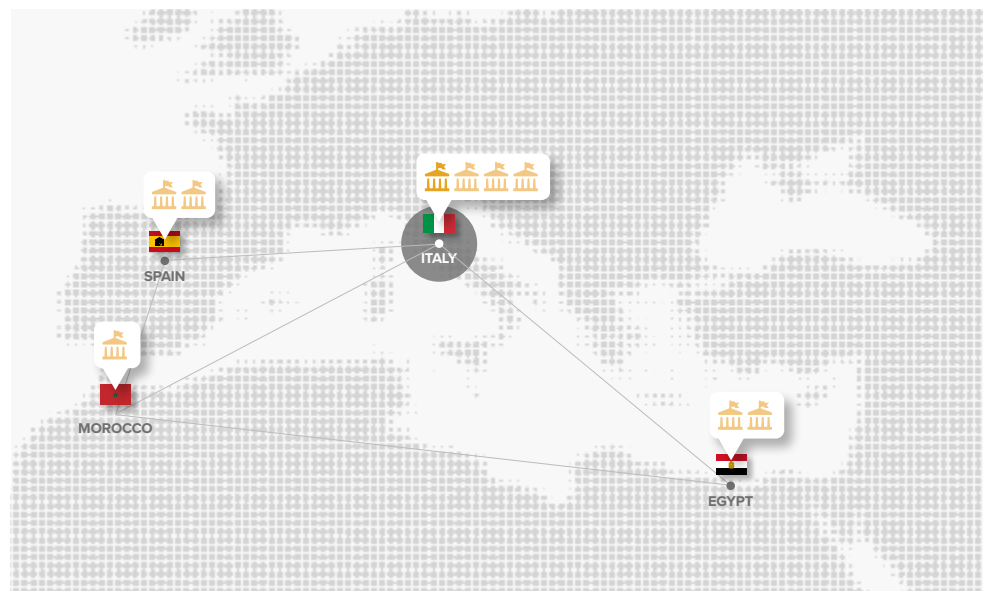
MENA countries are particularly exposed to international shocks in cereals' markets because they largely rely on import to feed their population. A deep understanding of such external shocks and stressors and of the coping strategies is fundamental for: a) private actors, in order to promptly react and to adjust their plans accordingly; b) public actors, in order to design resilience policies and strategies.

Objective and contents

The project aims at informing private and public resilience strategies through new evidence-based knowledge that is created, systematized and spread on external stressors and shocks deriving from cereal global value chains (GVCs) on the MENA region and on the feasible local solutions to address them. More particularly the project will 1. generate a better understanding of the external stressors and shocks that derive from GVCs and threaten local cereal supply chain and food security. 2. develop innovative solutions and evidence-based recommendations that governments and economic actors of the MENA food systems along the cereal value chain can use to enhance the resilience of the systems and ensure food security. 3. improve preparedness of governments and economic actors along the cereal value chain to anticipate and cope with external stressors and shocks by integrating new knowledge and data from available platforms into a Dashboard and a DSS to guide adoption of solutions identified by the project.

Expected impacts and results

The identification of resilience enhancing trade policies' and the recommendations for public procurement can foster cooperation in the Mediterranean region. The recommendations for smallholders storage can impact on post-harvest losses and access to finance. The design of agricultural machinery can increase productivity of



Other in Consortium/ 8

Università di Scienze
Gastronomiche di Pollenzo - IT
Collegio Carlo Alberto - IT
Soc. Coop. Agroalimentare e
Agroindustriale del BRADANO
SPA - IT

Economic Research Forum - EG
Confederation of Egyptian
European Business Associations
- EG

Euro-Mediterranean Economists
Association - ES

Association of the Mediterranean
Chambers of Commerce and
Industry - ES

Ibn Zohr University - MA

marginal land. The virtual water analysis of competing value chains and a strategy for the promotion of rainfed cereals can contribute to better incentives for producers and awareness on water intensive value chains and sustainable crops. A resilience assessment will strengthen strategies to cope with cereals supply risks. The supply chain risk information and decision support can ensure better trade and investment decision, better policies, reduced information asymmetries and better farmgate deals.

Keywords

#cereal_value_chain

#cereal_value_chain

#knowledge

#MENA_region

#cereal

#agricultural_stability



New products and solutions:

- ✓ design of multipurpose agricultural machinery;
- ✓ dashboard and Decision Support System



Thematic Area

Nexus



Action and Topic

IA - Innovation Action



Budget

4.077.000,00 €



Duration

36 months



State and Coordinator Entity

FRANCE

Mediterranean Agronomic
Institute of Montpellier (IAMM)

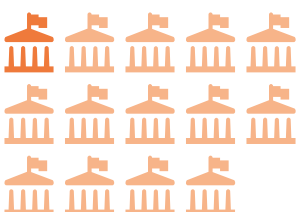


Scientific Coordinator:
KLEFTODIMOS, Georgios

Participating States/ 9



Research Units/ 14



Section 1

DIONYSUS

Operational adaptation Nexus-based systems solutions in Mediterranean

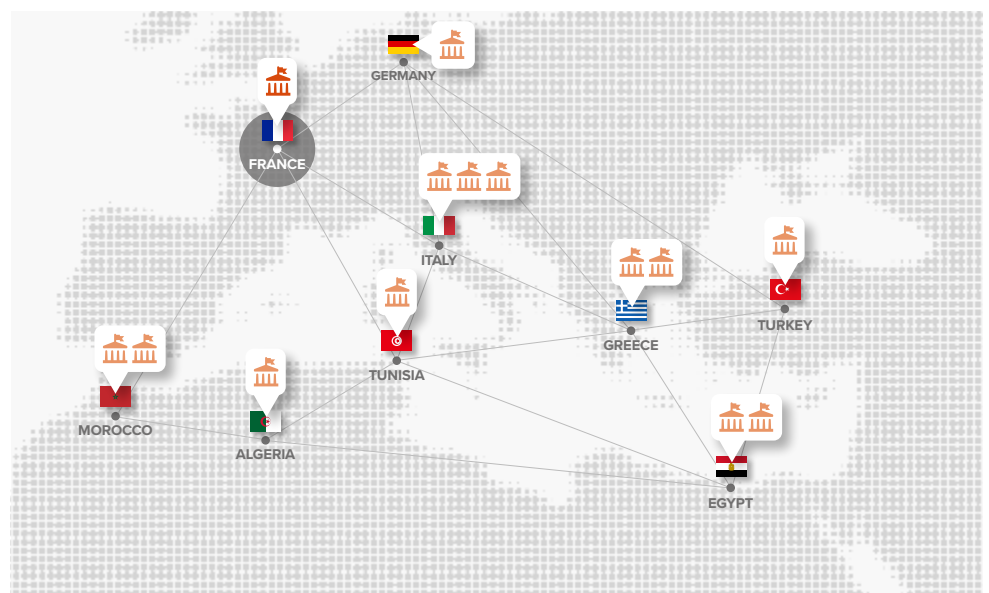
Context

The DIONYSUS project aims to co-design, test, and develop operational adaptation solutions through innovative business-based models for efficient use and saving of water, energy, food, and ecosystem (WEFE) resources. The project focuses on four Demonstration Sites (DSs) located in Egypt, Greece, Morocco, and Italy and three Replication Sites (RSs) in Turkey, Tunisia and Algeria, which produce essential agricultural products such as cereals, fruits, vegetables, cotton, and other industrial crops. Given the projected trends over the next 30 years in climate, natural resources, urbanization, markets, and macro-economic variables, DIONYSUS seeks to promote sustainable market solutions that leverage local and regional initiatives. By federating and engaging local stakeholders, the project will mobilize a Cross-Sectoral Nexus adaptation tool to facilitate the transition to a Green Economy and Sustainable Development.

Objective and contents

DIONYSUS will achieve its objectives through several key activities:

- establishing Demonstration and Replication Sites: develop and implement operational adaptation solutions in 4 DSs and 3 RSs to produce cornerstone agricultural products while sustaining local communities and addressing dwindling WEFE resources;
- creating Action-Panels: form 7 Action-Panels using a participatory approach to co-design operational adaptation solutions, prioritize optimization indicators, and co-develop WEFE toolboxes and guidelines;
- developing the DIONYSUS-inov Platform: create an innovative web-based Decision Support System (DSS) platform that serves as a toolbox providing guidelines to decision-makers;
- upscaling Solutions: Integrate operational adaptation solutions through the creation of a "DIONYSUS Think-Tank" to capitalize on the results of the DSS platform across the Mediterranean region and to drive transformative strategies aligned with sustainable development goals and regional policy frameworks. The project will also develop



Other in Consortium/ 13

Consorzio di Tutela Arancia Rossa di Sicilia IGP (AranciaRossaIGP) - IT

University of Catania - Dipartimento di Agricoltura Alimentazione e Ambiente (Di3A) - IT

Almaviva The Italian Innovation Company S.p.A. (Almaviva) - IT

Institute of National Planning (INP) - EG

Egyptian Association for Sustainable Development (EASD) - EG

University of Thessaly (UTH) - GR TOEV Tavropou Karditsas (TOEV) - GR

Mohammed VI Polytechnic University (UM6P) - MA

Université Ibn Zohr (UIZ) - MA Research Center for Applied Economics for Development (CREAD) - DZ

Leibniz-Zentrum Für Agrarlandschaftsforschung (ZALF) - DE

National institute for Agricultural Research Tunisia (INRAT) - TN

Ankara University (AU) - TR

a modelling chain, combining the DAHBSIM model and the Computable General Equilibrium (CGE) model, to support quantitative strategic planning and enhance long-term adaptive capacity to dwindling WEFE resources in the Mediterranean Region. This platform will enable stakeholders to test various experiments, respond to challenges, assess the impact of innovations on social and economic performance, and build tailored business models to support economic activities.

Expected impacts and results

DIONYSUS aims to support the Nexus cross-sectoral concept as a tool in climate adaptation and mitigation strategies by designing optimal adaptation Nexus solutions. These solutions will be translated into effective toolboxes and guidelines that are easily applicable in different study areas, facilitating the implementation of WEFE strategies. The anticipated impact includes significant positive effects on local employment, rural living standards, household income development, national GDPs, access to markets, imports/exports, inequalities, and WEFE resources. By advancing sustainable market solutions and mobilizing local stakeholders, DIONYSUS will contribute to the transition towards a Green Economy and Sustainable Development in the Mediterranean region. Furthermore, DIONYSUS will establish the "DIONYSUS Think-Tank," a transformative initiative composed of key regional institutions. This visionary body will play a pivotal role in shaping future strategies for the Mediterranean region. It will capitalize on methodological insights and empirical findings from DSs and RSs to formulate pragmatic operational adaptations and sustainable market-oriented solutions. The Think-Tank will collaborate with relevant EU initiatives such as PRIMA, H2020, and Horizon Europe, fostering integrated WEFE policy paradigms and driving transformative change across sectors. a Green Economy and Sustainable Development in the Mediterranean region.

Keywords

#WEFE-Nexus

#WEFE_operational_adaptation_solutions

#modelling_chain

#local_employment

#climate_change

#Nexus_decision-making_tool

#local_communities

#inequalities



Demo sites/case studies

7

Platforms / Hub

4

New products and solutions:

- ✓ a roadmap for the Co-design of WEFE operational adaptation solutions and business models;
- ✓ DIONYSUS-inov platform: The DIONYSUS-inov platform will provide a conceptual and evaluative open access online tool for all stakeholders to easily assess the impacts of the WEFE operational adaptation solutions at farm, national and international levels;
- ✓ DIONYSUS Think-Tank: The DIONYSUS Think-Tank will act as a Knowledge Transfer Accelerator (KTA). Its aim is to support stakeholders, both within and outside the project, and to acquire and share knowledge-based solutions and information.

Thematic Area

Nexus



Action and Topic

IA - Innovation Action



Budget

4.055.000,00 €



Duration

36 months



State and Coordinator Entity

SPAIN

Forest Science and Technology
Centre of Catalonia (CERCA)



Scientific Coordinator:
MANEJA, Roser

Participating States/ 7



Research Units/ 10



Section 1

RES-MAB

Promoting WEFE Nexus-based adaptation and mitigation solutions and landscape resilience to climate change in the Mediterranean Biosphere Reserves

Context

The multiple interacting climate hazards and anthropogenic drivers of change in such a vulnerable hotspot like the Mediterranean, affect the region's biodiversity, besides people's livelihoods, food security and traditional ecological and local knowledge. This problem requires specific solutions that support populations at higher risk of exposure. RES-MAB focuses on UNESCO Biosphere Reserves (BR), areas recognized for their contribution and capacity to balance human activity and nature conservation; and implements in seven of them the holistic WEFE Nexus approach, under a perspective of socio-ecological resilience that acknowledges the interconnectedness of the WEFE resources and enhances the cooperative capacity of stakeholders to react and respond preventively and proactively to change.

Objective and contents

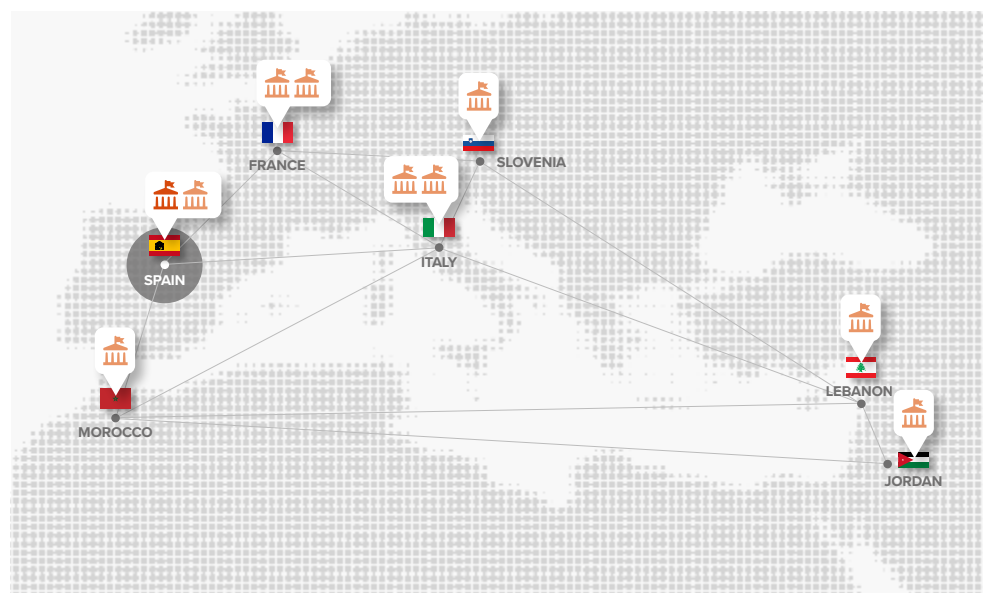
SO1. To promote an integrative (multi-functional, multi-scale, multi-actor and cross-sectoral) landscape management approach by developing and implementing a WEFE-Nexus Socioecological Modelling Tool (hereafter WEFE-SEM Tool) to enhance resilience and adaptation to CC in 7 UNESCO Mediterranean BR.

SO2. To integrate the WEFE-SEM Tool into cross-sectoral policies, and development and action plans to provide medium- and long-term actionable information and capacity building for decision-makers, and facilitating long-lasting adaptation capacity, especially for potentially vulnerable populations.

SO3. To co-create and develop a Mediterranean network of 7 BR demonstration sites (hereafter BR demo sites) focused on promoting 8 climate-resilient and transformative WEFE Nexus-based adaptation and mitigation solutions (hereafter WEFE Nexus solutions).

SO4. To assess and monitor the environmental and socio-economic impacts in the 7 BR demo sites to achieve more adaptive, cohesive and resilient Mediterranean BR in the face of CC.

SO5. To promote sustainable market solutions and the engagement of the private sector by developing innovative business models (BM) targeting WEFE Nexus solu-



Other in Consortium/ 9

Alto Bernesga Biosphere Reserve Foundation (Alto Bernesga) – ES

Mont-Ventoux Natural Regional Park (Mont-Ventoux) – FR

Organization for the Defense and Management of AOC Ventoux (AOC Ventoux) - FR

Veneto Regional Park of Po Delta Authority (Po Delta) – IT

Istituto Oikos (OIKOS) – IT

Royal Society for the Conservation of Nature (RSCN) - JO

Association for the Protection of Jabal Moussa (APJM) – LE

National Agency for the Development of Oases and Argan Zones (ANDZOA) – MA

Public Institute Park Skocjan Caves (PSJ) – SL

Demo sites/case studies

7 

Platforms / Hub

4 

tions while enhancing inclusive economic development and resilience of vulnerable communities.

Expected impacts and results

RES-MAB seeks to achieve the following impacts with reference to the WEFE sectors: Integrate the Nexus perspective into climate policies and the adaptation perspective into development plans for better policy integration:

- 1) Uncovering the linkages between CC and development priorities, as well as the governmental, institutional and political context;
- 2) Generating a change of perspective and perception on the sector and policy decision makers when the BR are managed in an integrated manner, reinforcing the mobilization of tech transfer and knowledge towards new procedures and digital tools;
- 3) Integrating adaptation and mitigation issues into ongoing policy processes, thus detecting potential climate change adaptation needs to be supported by integrated, cross-cutting policy approaches;
- 4) Identifying WEFE adaptation and mitigation actions as response to CC that also have development benefits and vice versa (win-win approach);
- 5) Consulting mainstreaming specialists and adaptation experts, who bring their added value to the overall endeavour.

Keywords

#biosphere_reserves

#landscape_resilience

#cross-sectoral_policy

#WEFE_Nexus_adaptation_and_mitigation_solutions

#climate_change

#sustainable_development

#local_communities

#multi-actor_approach



New products and solutions:

- ✓ WEFE Nexus Socioecological Modelling Tool (i.e. WEFE-SEM Tool);
- ✓ WEFE Nexus solution implemented in the Alto Bernesga BR demo site;
- ✓ WEFE Nexus solution implemented in the Mont-Ventoux BR demo site;
- ✓ WEFE Nexus solution implemented in the Jabal Moussa BR demo site;
- ✓ WEFE Nexus solution implemented in the Arganeraie BR demo site;
- ✓ WEFE Nexus solution implemented in the Dana BR demo site;
- ✓ WEFE Nexus solution implemented in the Po Delta BR demo site;
- ✓ WEFE Nexus solution implemented in the Karst BR demo site



Project factsheets

Section 2 /S2

Project factsheets follow the order by Thematic Area
(Water management; Farming Systems; Agri-food Value Chain)



SM@WA-MEDI /S2
WATER4MED /S2



3D-STELLAR /S2
BIOACT /S2
CombiFarm /S2
CYCLOLIVE
EcoFertiS /S2
PAVER
Sun2Fork
SUPREM-MILK



A-BLOCK /S2
AgriBioPack /S2
BIOMEDPACK /S2
DurInnPack /S2
EVOLVEPACK /S2
FoWRSaP /S2
INTACTBioPack /S2
MATE4MEAT /S2
NOVAPACK /S2
NOVISHPAK /S2
OLIVEPACK /S2
PASPACK 4.0 /S2
PLAMINPACK /S2
QuiPack /S2
SAFOOD4MED /S2
SAPHIRA /S2
SuN4Med /S2

Thematic Area

Water Management



Action and Topic

RIA - Research and Innovation Action



Budget

440.000,00 €



Duration

36 months



State and Coordinator Entity

TUNISIA

University of Carthage, higher
Institute of Environmental
Sciences and Technologies
(UCAR)

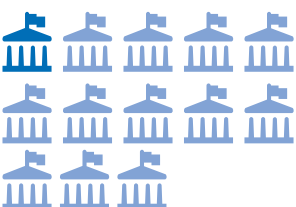


Scientific Coordinator:
PUJADES GARNES, Estanislao

Participating States/ 6



Research Units/ 13



Section 2

Sm@wa-Medi

New Sm@rt Process Combining Nanotechnology-Magnetic-Filtration for Brackish and Natural Water Treatment to Enhance Irrigation Efficiency and Agricultural Yield in the Mediterranean basin

Context

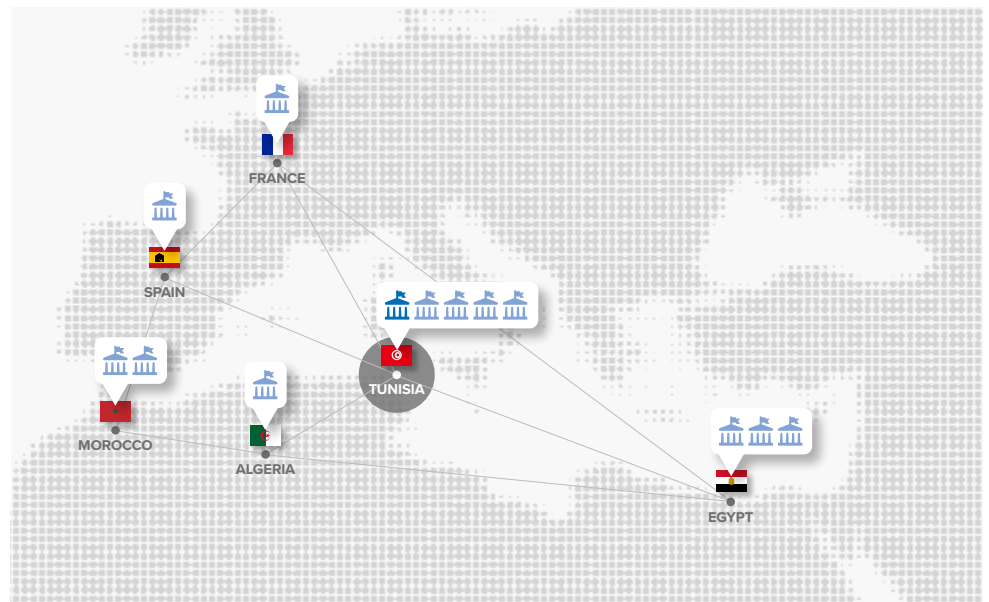
In the Mediterranean basin, climatic changes in 30 years will lead to a temperature increase of 2°C to 4°C which would reduce rainfall by up to 30%. This fact will increase the establishment of water limits. In addition, water demand is expected to be multiplied by 2 and even 3. Furthermore, its utilization is unbalanced by various sectors (Industry, Tourism, Agronomy,...) and at different scales (The field of agriculture is considered to be the most consuming water from 70% to 80%).

This situation contributes to the degradation of the irrigation water, (essentially scarcity and high salts concentrations) which is accentuated by overexploitation of the natural resources, poor management and pollution. These facts will limit the development of the agriculture and affects crop yields which increase food prices and food security challenges.

Objective and contents

In order to overcome the problems of charged water and scaling problems, researchers have been proposing several techniques for water treatment, such as desalination, filtration, electrodialyse,...

Desalination treatment requires high energy consumption and high technical skills for monitoring and changing membranes. Furthermore, the high costs of the used energy causes excessive costs and additional burdens to farmers, investors and governments. The classical filtration process is based on commercial membranes and also presents a weak technical efficiency method for water treatment. This is due to the weak capacity of the membrane to trap small sizes of both minerals and salts having about tens of nanometers scales. To overcome such drawbacks, recent techniques such as magnetic and nanotechnology treatments have been developed.



Other in Consortium/ 12

Agence de la vulgarisation et de la formation agricoles Tunisie - TN

Faculty of Sciences Sfax - TN

National Center of research in Materials Science Borj Cedria - TN

TELCOTEC - TN

City of Scientific Research and Technological Applications (SRTA-City) - EG

DELTA WATER - EG

National Research Center Cairo - EG

Agronomy and veterinary institute Hassan II (IAV Hassan II) - MA

National School of Applied Science, Ibn Zohr University - MA

Faculty of Nature and Life Sciences, University of El Oued - DZ

University of Grenoble / Université Savoie Mont Blanc - FR

Instituto regional de investigaciòn Científica Aplicada - ES

The incorporation of magnetic fields in agriculture is considered a potential solution to reduce the salinity problems of the irrigation water. The optimization of the influencing agronomic factors combined to the utilization of magnetic fields, offers different advantages such as increase of yields crops, water productivity, reduction of costs,... Thus, magnetized water used for irrigation improved the efficiency of irrigation systems and the agricultural crops production. In fact, magnetic treatment of irrigation water improves root growth by increasing soil nutrient availability and leading to a better assimilation of nutrient and so an increase in fertilizers efficiency.

On the other hand, nanotechnology revolution and are introduced to solve the water quality problem by effective and cheap treatment techniques. The percentage of treatment (charges) can reach up to 85% of specific elimination.

In agriculture, multifunctional nanomaterials are simultaneously experimented as mineral nano-filters, salts and nano-fertilizers.

Expected impacts and results

This technique could be an efficient strategy to specially enhance the quality of irrigation water, to foster plant growth and agricultural yield. The project includes some sustainable development goals (SDGs) (mainly the improve the water management, the quality and increase agricultural production, SDG2 end hunger, achieve food security and improved nutrition and promote sustainable agriculture, SDG6 goes beyond drinking water, sanitation and hygiene to also address the quality and sustainability of water resources ...). In this context, a new precise sm@rt process (Sm@wa-Medi) applied in the field of agriculture will be developed based on the combination: Nanotechnology-Magnetic-Filtration treatments using nanofiber. So, the project investigates machine learning and intelligents systems for learning, modeling, optimization, and prediction of parameters of the water treatments for enhanced agriculture. The objective of Sm@wa is to offer a system for water treatment technology and solutions that should help Mediterranean to better govern and manage water resources and protect the quality of water, soil and increase crop yields by improving the performance of irrigation systems and minimizing costs and increasing profit margins.



Thematic Area

Water Management



Action and Topic

RIA - Research and Innovation Action



Budget

984.468,00 €



Duration

36 months



State and Coordinator Entity

SPAIN

Consejo Superior de Investigaciones Científicas (CSIC)



Scientific Coordinator:
PUJADES GARNES, Estanislao

Participating States/ 7



Research Units/ 7



Section 2

WATER4MED

Water management strategies and Adaptation actions under a global change context FOR the MEDiterranean region

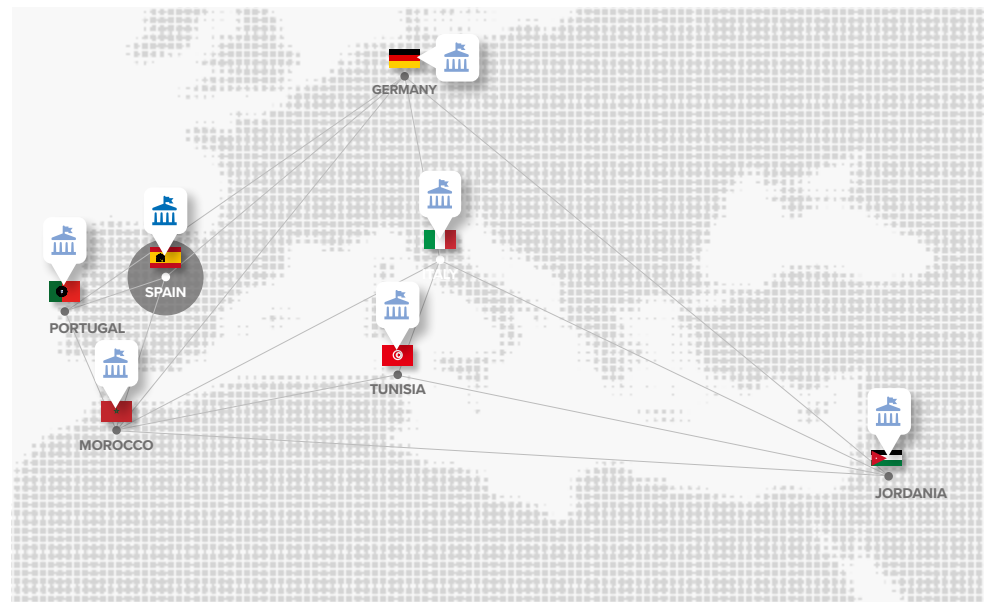
Context

The Mediterranean region suffers from increasing water scarcity exacerbated by climate change and increasing population. Another consequence of climate change is the occurrence of extreme rainfall events. Moreover, most Mediterranean countries face water governance challenges. Then, it is crucial to (i) provide innovative tools to enhance governance models and design efficient water management strategies and (ii) propose solutions to mitigate water scarcity during droughts and prevent flooding during precipitation periods.

Objective and contents

The primary goal of WATER4MED is to provide a robust approach to enhance Mediterranean water governance models by managing water resources efficiently, and providing viable alternatives to increase water storage capacity and mitigate floods. The specific objectives (SOs) of WATER4MED are summarised below:

- 1.SO1: Development of a numerical approach coupling hydrological and hydrogeological models.
- 2.SO2: To propose methods for characterising the resilience of catchments to climate change.
- 3.SO3: To assess groundwater vulnerability to anthropogenic impacts and climate change.
- 4.SO4: Explore the suitability of managed aquifer recharge systems with high capacity (Flood-MAR).
- 5.SO5: To incorporate the developed approaches into water governance models using integrative tools for water resources planning.



Other in Consortium/ 6

Luis Samaniego - DE

Politecnico di Bari (POLIBA) - IT

Al-Balqa Applied University - JO

University Ibn Zohr - MA

Universidade de Lisboa - PT

Laboratoire de recherche Sciences
et technologies des eaux (LRSTE)

- TN

Expected impacts and results

WATER4MED will propose numerical approaches to predict the impact of climate change and growing demand on water resources. These predictions will be able to be incorporated in governance models to improve water management by anticipating the available water in the future. Better management strategies will reduce conflicts. Numerical models will allow adopting actions to protect water resources and dependent water ecosystems.

WATER4MED will apply advanced approaches (i) to assess water vulnerability against climate change and anthropogenic impacts and (ii) to characterise water quality-related mechanisms, contributing to the protection of water resources. Among others, approaches will be applied to assess pollution sources, renewal times or impact of CECs.

Designed innovative Flood-MAR systems will contribute by increasing the stored water resources and minimising flooding events.

The integration of all results and approaches (numerical predictions, vulnerability, pollution sources, quality status, resilience capacity, impact of CECs...) on WEAP will contribute to enhancing water governance models.

Demo sites/case studies

5 

Keywords

[#water_resources](#)

[#climate_change_impact](#)

[#growing_water_demand](#)

[#climate_change_adaptation](#)

[#water_management_tools](#)

[#climate_resilience](#)

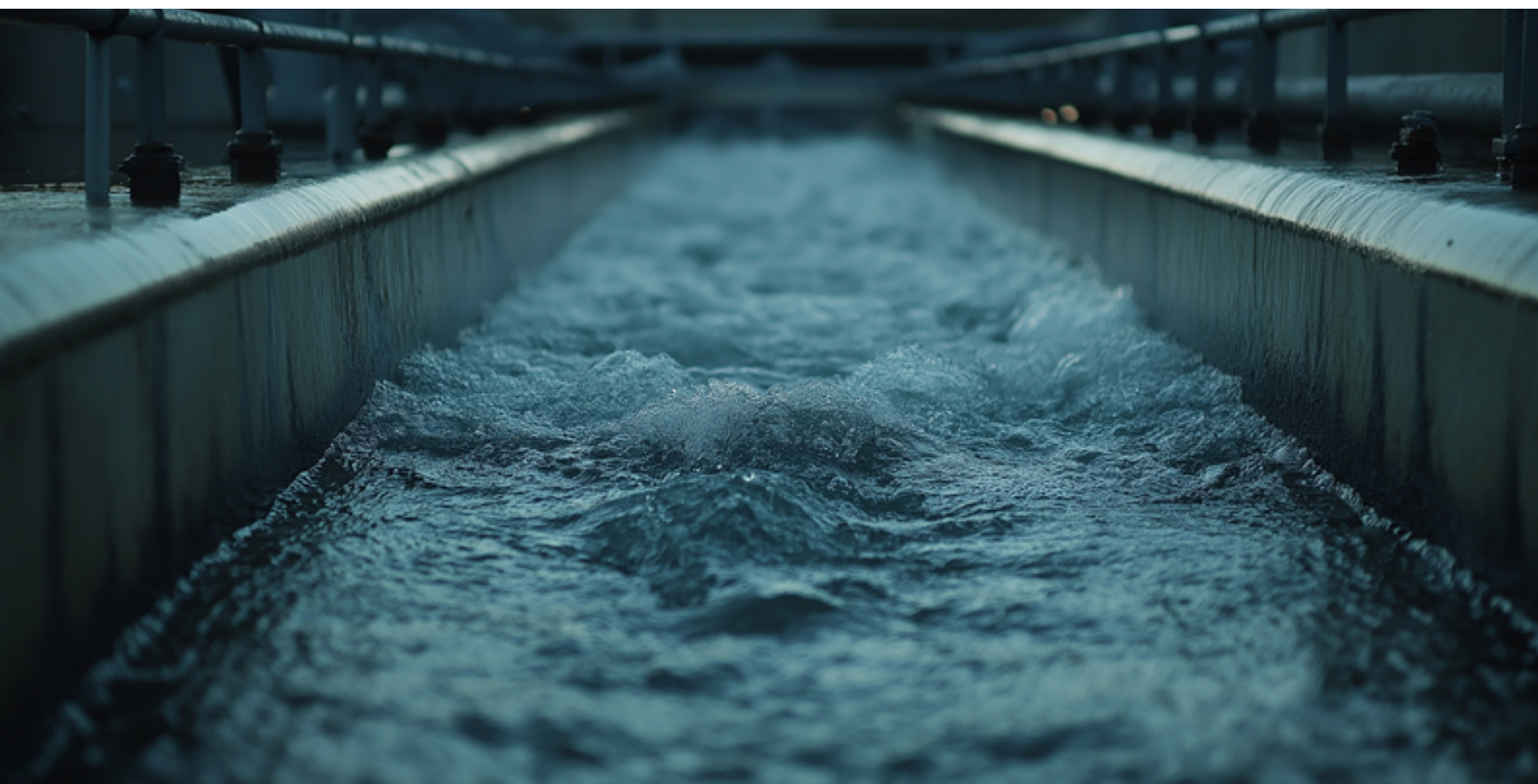
[#groundwater_models](#)

[#hydrological_models](#)

[#organic_contaminants_of_emerging_concern](#)

[#managed_aquifer_recharge](#)

[#flood_mitigation](#)



Thematic Area

Farming Systems



Action and Topic

RIA - Research and Innovation Action



Budget

610.000,00 €



Duration

36 months



State and Coordinator Entity

FRANCE

Institut Jean Lamour (IJL)



Scientific Coordinator:
NICOLAS, Vincent

Participating States/ 3



Research Units/ 5



Section 2

3D-STELLAR

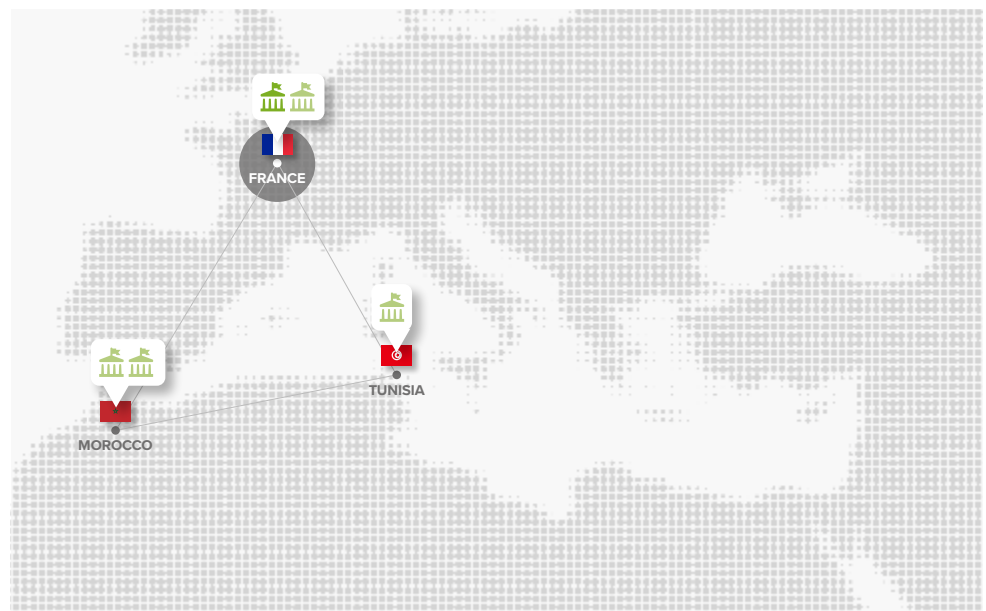
3D Solar disTillEr and flash pyroLysis for recycling oLive mill wastewater into irrigation water and biochAR

Context

The countries of the Mediterranean basin produce about 97% of the world's olives, which represents to up to 3 million tons of olive oil per year. The various processes of olive oil extraction generate huge amounts of solid and liquid waste. It is estimated that the processing of 1 ton of olives would generate on average 1 m³ of Olive Mill Waste Water (OMWW).

Objective and contents

The 3D-STELLAR project aims to treat and valorize the toxic OMWW according to the principles of green and sustainable chemistry for a circular economy. Current regulations only authorize the direct spreading of these materials in a small proportion of the volumes generated, and industrialists are looking for other ways to manage this toxic liquid waste. The 3D-STELLAR consortium will explore the possibilities of treating these effluents and proposes to study the means of accelerating their evaporation/drying in order to better transform and valorize them. 3D-STELLAR project is based on two main technologies: 3D-Solar Distillers, which have the advantage of having a low environmental impact to clean water and, flash pyrolysis with thermal shock that does not generate by-products and is very fast. A mobile prototype (semi-pilot) capable of treating the equivalent of a 1 m³ tank will be built and installed in the field to validate the concept described in the 3D-STELLAR project.



Other in Consortium/ 4

French National Research
Institute for Agriculture, Food and
Environment - FR

Université HASSAN II, Fsad et
Fstm - MA

Laboratoire Génie des Matériaux
pour Environnement et
Valorisation – MA

Laboratory of Water, Energy and
Environment, Sfax National School
of Engineers, University of Sfax -
TN

Demo sites/case studies



Expected impacts and results

Our proposal addresses section 2.2 “Farming systems”, A step toward carbon-neutral farms: coupling renewable energy sources with circular farming systems. This project proposes a circular, low-carbon approach to olive oil processing. With the implementation of 3D STELLAR, water will be recycled and harvested using solar energy and the concentrated sludge will be converted into nutritious/value-added products. Thus,

Keywords

#Olive_Mill_Waste_Water (OMWW)

#circular_economy

#solar_distiller

#solar_energy

#water_recycling_and_harvesting

#flash_pyrolysis

#sludge_valorization

#biochars

#soil_amendment



New products and solutions:

- ✓ solar distiller;
- ✓ flash pyrolysis

Thematic Area

Farming Systems



Action and Topic

RIA - Research and Innovation Action



Budget

1.186.700,00 €



Duration

48 months



State and Coordinator Entity

ITALY

University of Turin (UNITO)



**UNIVERSITÀ
DI TORINO**

Scientific Coordinator:
VIGANI, Gianpiero

Participating States/ 5



Research Units/ 7



Section 2

BIOACT

Benefits assessment of on-farm regenerative agricultural practices on durum wheat systems to promote climate emergency-based sustainability and food security in the Mediterranean area

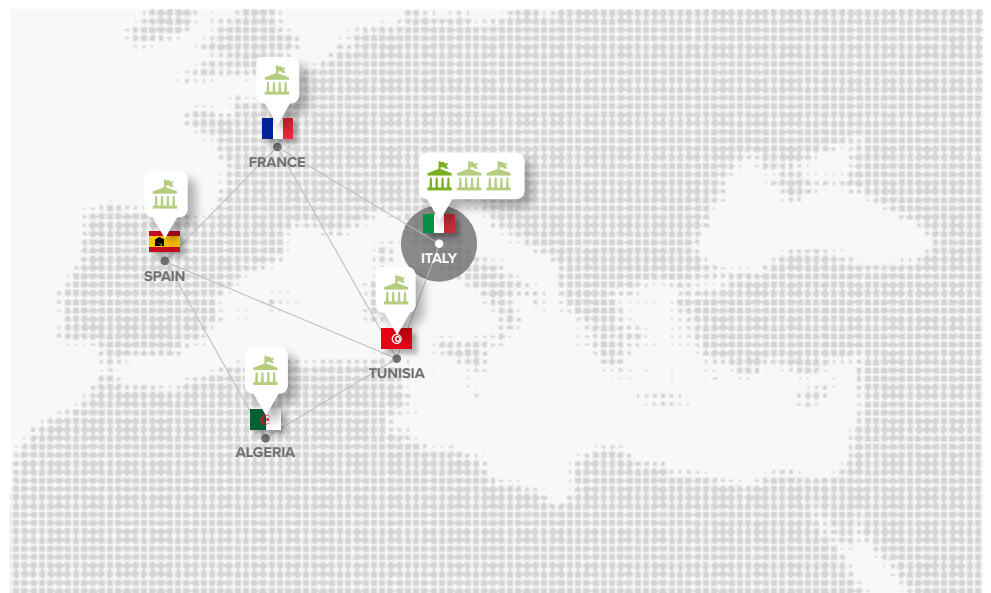
Objective and contents

Durum wheat is one of the world's most consumed cereals, in the Mediterranean diet, and thus an essential crop for global food security. Despite the relatively good adaptability of durum wheat to a wide variety of soils, climate change is posing a serious risk to wheat farmers in many regions of the world, including the Mediterranean area, due to the enhanced frequency and intensity of drought. Therefore, reducing yield losses due to water stress by developing more understanding and approaches to overcome these issues and preserving the crop from drought.

Objective and contents

The strategic goal of BIOACT is to provide solutions for improving agroecosystem resilience to climate change, and for reducing chemical inputs and waste production in the Mediterranean area.

BIOACT will exploit drought tolerant durum wheat cultivars and explore indigenous plant/soil beneficial microbiome in wheat/legume cropping systems aiming to establish novel regenerative agricultural practices enabling low chemical input, improved soil health, GHG mitigation, zero waste and high agricultural productivity in arid and marginal land agroecosystems. Durum wheat cultivars, selected among a wide collection from PRIMA EXPLOWHEAT project, will be tested. BIOACT will investigate whether adaptation mechanisms of wheat cultivars to abiotic stress may benefit from legume intercropping and the addition of a microbial-based formulations (BioA) developed on DW residues throughout solid state fermentation.



Other in Consortium/ 6

University of Brescia (UNIBS) - IT

University of Tuscia (UNITUS) - IT

Ecole Nationale Supérieure
Agronomique (ENSA) - DZ

Universitat Jaume I Castellón - ES

Institute de Research pour le
développement (IRD) - FR

Center of Biotechnology of Sfax -
TN

Expected impacts and results

Decrease in CO2 emissions. BIOACT will promote soil fertility through the implementation of regenerative agronomic practices, drawing down climate-damaging levels of atmospheric CO2 and improving soil structure.

Improve the land productivity. BIOACT will introduce a novel cropping system based on regenerative agriculture concept focused on maximum exploitation of the natural biodiversity of agroecosystems located in arid and marginal land.

Improving the efficient use nutrients in the farming systems by adopting a circular bio-economy approach. BIOACT will minimize the risk of failure associated with yield losses due to inappropriate farming systems and climate change by promoting a sustainable agroecosystems production

Keywords

#durum_wheat

#microbiome

#intercropping_systems

#regenerative_agricultural_practices



Demo sites/case studies

3

New products and solutions:

✓ BioA formulation



Thematic Area

Farming Systems



Action and Topic

RIA - Research and Innovation Action



Budget

758.106,00 €



Duration

36 months



State and Coordinator Entity

TUNISIA

INRAT - Agricultural Research Establishment



Scientific Coordinator:
ZOGHLAMI, Rahma Inès

Participating States/ 6



Research Units/ 12



Section 2

CombiFarm

Combining low-cost biochar, biogas, and cyanobacteria fertigation technologies with low-input crops for sustainable bioproducts in smart circular farming systems

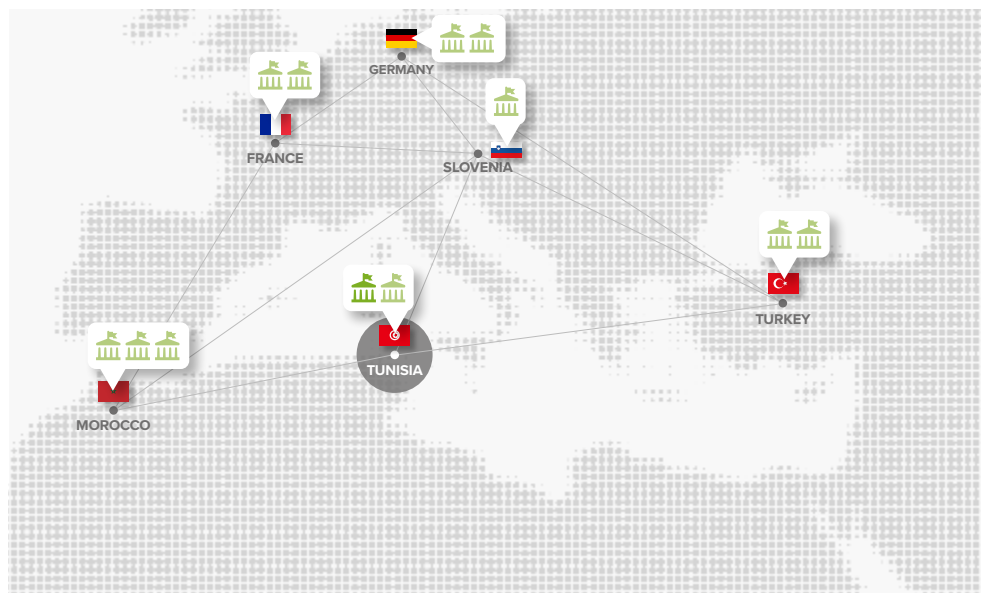
Context

CombiFarm takes a multi-faceted approach to rectify some of the most intractable problems in both agriculture and sustainability. This experiment-based research project will help to address some of the many issues we currently face in agri-tech and in the need for a more sustainable farming system both environmentally-friendly and profitable for the farmer. Currently, many of our conventional farming systems depend on high inputs of chemicals such as fertilizers and pesticides. These chemicals have many adverse impacts on the environment, soil health, and potentially, human health, as well as contributing to soil erosion and depletion of nutrients. CombiFarm research focuses on low-input perennial crops and crop rotation as potential ways to mitigate these issues. These systems allow us to reduce fertilizers and pesticides in agricultural systems. They also improve soil structure and function, enhancing water retention and nutrient cycling, while also increasing biodiversity by providing food and habitat for beneficial insects and pollinators.

Objective and contents

The primary goal of the CombiFarm project is to develop circular farming systems that aims to close the cycle of resource usage by minimizing waste and maximizing efficiency and to promote sustainability by utilizing resources efficiently and reducing reliance on external inputs.. The project will take advantage of innovative technologies such as low-cost biochar, biogas, and microalgae fertigation in order to integrate energy, carbon, and nutrient recovery systems. In fact, the use of pyrolysed organic matter (Biochar) as a soil amendment and microalgae fertigation improves soil fertility and carbon sequestration, while the use of anaerobically digested organic matter (Biogas) involves the production of methane.

Another objective of the project is to develop sustainable cropping systems by highlighting the cultivation of low-input crops (water, fertilizer, pesticides). The selected crops include alfalfa, sorghum, durum wheat, pearl millet, lentils, aloe vera, prickly pear cactus, salicornia, glassworts, and aromatic crops. Through these selected crops, the project aims to reduce the environmental impact of agriculture while ensuring food security and resilience to climate change.



Other in Consortium/ 11

Centre des Recherches et des Technologies des Eaux - TN

Institut National de la Recherche Agronomique Morocco - MA

Sultan Moulay Slimane University - MA

Université Hassan Ier - MA

Laboratoire de Genie des Procédés - Environnement - Agroalimentaire - FR

Mind and go - FR

Hamburg University of Technology - DE

Viride Germany GmbH - DE

Eskisehir Technical University - TR

Geobilgi Bilisim Tecknolojileri - TR

University of Ljubjana - SL

Demo sites/case studies

4 

Platforms / Hub

1 

On the other hand, the CambiFarm project aims to enhance water efficiency and reduce reliance on fossil fuels. In fact, the project will use solar energy in smart drip irrigation systems. This system allows to minimize evaporation and run-off. Additionally, by using these technologies the project is contributing to renewable energy use and reducing greenhouse gas emissions from agriculture.

The ultimate objective is to develop high-value bioproducts in the surrounding area. Since the products generated from agricultural activities are diversified (food, feed, cosmetics, and biopesticides), the project will create additional income for farmers while promoting economic development in rural areas. Moreover, several biopesticides that the project will generate will replace toxic chemical pesticides that contribute to environmentally friendly pest management practices.

Expected impacts and results

The CambiFarm project aims to achieve agro-environmental and economic benefits. In fact, the use of biochar as soil amendment, microalgae fertigation, and biogas as renewable and clean energy allows the reduction of waste and increases efficiency. On the other hand, these practices enhance soil fertility and carbon sequestration by leading soil health. Indeed, the use of low-input crops and renewable energy sources helps to decrease dependence on chemical fertilizers, pesticides, and fossil fuels that contribute to reducing greenhouse gas emissions. Also, these crops require fewer resources that promote sustainable agriculture under a resilient system to climate change.

Keywords

#biochar

#biogas

#microalgae_fertigation

#low-input_crops

#circular_farming

#sustainable_agriculture



New products and solutions:

- ✓ sustainable cropping system;
- ✓ hybrid energy system;
- ✓ agro-industrial wastewater treatment using microalgae



Thematic Area

Farming Systems



Action and Topic

RIA - Research and Innovation Action



Budget

1.475.091,00 €



Duration

36 months



State and Coordinator Entity

MOROCCO

University of Cadi Ayyad



جامعة القاضي عياض
UNIVERSITÉ CADI AYYAC

Scientific Coordinator:
AZIZ, Faissal

Participating States/ 8



Research Units/ 9



Section 2

CYCLOLIVE

From waste to resource: ReCYCLing OLIVE oil extraction byproducts for sustainable agricultural practices in the Mediterranean region

Context

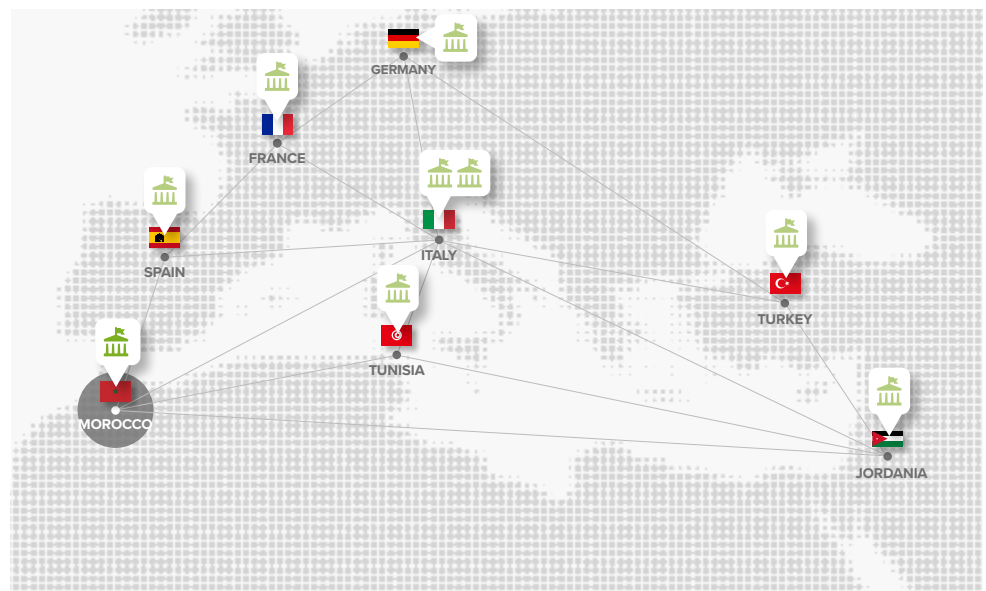
The Mediterranean region faces various issues related to unsustainable farming practices, such as the overuse of pesticides and fertilisers, soil degradation, and water scarcity. The unsustainable irrigation practices have further contributed to water scarcity in the region, exacerbating the effects of climate change. Among the various agricultural production chains of the Mediterranean area, the olive oil industry is undoubtedly one of the most important. During the olive oil extraction, the liquid waste OMWW is generated in large quantities, representing a relevant environmental issue.

Objective and contents

The CYCLOLIVE project aims to integrate the treatment of OMWW, the recycling of OMSW, and renewable energy strategies into practical and innovative solutions. These solutions will be user/environmentally friendly, and cost-effective. The ultimate goals are to reduce pollution, improve water availability for irrigation, lower food production costs, decrease reliance on conventional energy sources, and reduce CO₂ equivalent emissions. By achieving these objectives, the project aims to contribute to the European Green Deal's ambition of attaining climate neutrality by 2050. CYCLOLIVE will work towards achieving the following overarching long-term environmental objectives. (i) Reducing the reliance on traditional energy sources. (ii) Enhancing the recovery of water and nutrients in agricultural practices. (iii) Lowering food production costs through sustainable and innovative approaches. (iv) Raising awareness about the significance of maintaining a balanced use of environmental resources. (v) Influencing policies to prioritise sustainable management of energy and environmental resources. (vi) Stimulating the creation of new job opportunities and promoting the establishment of green SMEs in Mediterranean regions where OMWW treatment processes and OMSW conversion systems can be effectively implemented.

Expected impacts and results

CYCLOLIVE responds to all the impacts expected from the PRIMA Call, with particular reference to the (i) Decrease in CO₂ equivalent emissions by using alternative sources of local and renewable energy, (ii) Improving the overall efficient use



Other in Consortium/ 8

University of Florence (UNIFI) - IT

University of Turin (UNITO) - IT

University of Lorraine - FR

Forschungsverbund Berlin e.V. - DE

University of Jordan (UOJ) - JO

Spanish National Research Council
- ES

University of Sfax - TN

MetaMeta Anatolia - TR

of water, fertilisers, and nutrients in Mediterranean farming systems by adopting a circular bio-economy approach, (iii) Reduce the dependency on conventional energy suppliers, (iv) Improve the overall land productivity by integrating different cropping systems, (v) Use of local energy from renewable sources, (vi) Reducing the impacts of climate change on Mediterranean farming systems. It should also be noted that CY-CLOLIVE technical tasks have taken into account SDG#6 and SRIA Key Performance Indicators (KPIs) mentioned in the Call (i.e., Number of sustainable practices applied, Reduction of external use of entrants, Number of business models, Reduction of food costs production costs, Reduction of GHG).

Demo sites/case studies

4 

Platforms / Hub

8 

Keywords

#energy_efficiency

#wastewater_treatment

#agrifood_water_treatment

#reuse

#natural_based_material

#sustainability

#bio-economy

#AquaCrop

#Mircopollutants

#nitrogen_retention_at_root_level

#soilless_agriculture



New products and solutions:

- ✓ production of a high porosity biochar;
- ✓ pyrolytic conversion of OMSW into biochar for agriculture;
- ✓ transformation of OMSWs into WABs



Thematic Area

Farming Systems



Action and Topic

RIA - Research and Innovation Action



Budget

788.077,00 €



Duration

36 months



State and Coordinator Entity

ALGERIA

University of sciences and technologies Houari Boumedien (USTHB)



Scientific Coordinator:
BEKKARI, Nadjia

Participating States/ 6



Research Units/ 10



Section 2

EcoFertiS

Innovative processing of manures and biowastes of Eco-friendly Fertilizers

Context

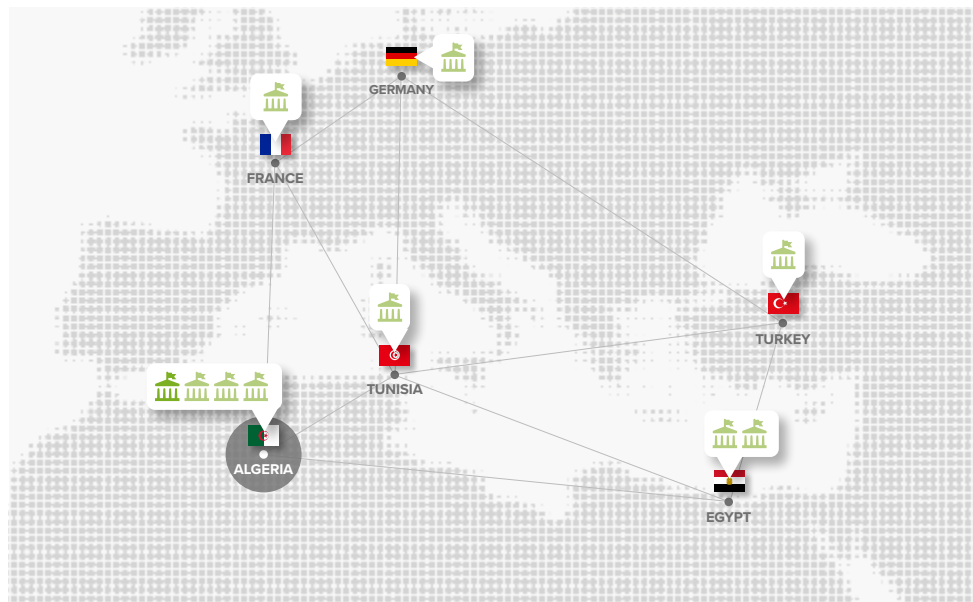
Manure uses in soil amendments have evolved for decades, caught up with world population growth and agricultural wastes increase, which caused more environmental issue. Currently, fertilizer prices have increased. EcoFertiS will provide effective fertilizers, using an improved recycling process, at low cost, healthier for soil and more safety for farmers. It should be noted that many processes have been developed but have encountered problems related to the production duration, foaming, EcoFertiS offers a rational and practical solution by adopting a physical and microbiological process.

Objective and contents

EcoFertiS target some main objectives seek to achieve, and aim to: i) supply effective and low-cost complete fertilizers, ii) improve and develop biowaste recycling and processing in industrial scale, by working on previous cons process treating Biowastes, iii) Protect the environment against pollution, and improve soil health, by reducing the consumption of mineral fertilizer, pesticides, and fungicides and iv) Reduce the water use for irrigation by improving the soil water preservation due to change of soil water texture. To achieve these objectives, EcoFertiS plan to: a) Set a New Biowaste recycling process (Prototyping and Piloting of the process); b) Develop a New Fertilizer formulations software and Low-cost fertilizing. c) Plan Farmer piloting program and valorization of EcoFertiS results

Expected impacts and results

EcoFertiS adopts a bioeconomy approach within the Mediterranean countries by improving the overall efficient use of new fertilizers and consequently water uses, aforementioned will improve land productivity by integrating different fertilizing systems. It will contribute to better carbon and nitrogen management practices, to mitigate the



Other in Consortium/ 9

École Nationale Supérieure
Agronomique (ENSA) - DZ

Centre de Recherche Scientifique
et Technique en Analyses Physico
– Chimique (CRAPC) - DZ

Université de Mostaganem
Abdelhamid Ibn Badis (UMAB) - DZ

Arab Academy for Science,
Technology and Maritime
Transport (AASTMT) - EG

South Valley University (SVU) - EG

Université de Reims Champagne-
Ardenne (URCA) - FR

WAZIUP Open Source IoT and
Cloud platform - DE

Institut National de la Recherche
en Génie Rural, Eaux et Forêts
(INRGRF) - TN

International Association For
Resilience & Trauma Counseling
(IARTC) - TR

impact of climate change and environmental challenges including biodiversity loss and pollution, which is a long-term impact. EcoFertiS deals with the cost of amendment for all species of crops and varieties per season, and guaranty food quality. An important impact of collaboration between multi-actors will contribute to the development, production, and distribution of new green fertilizers from wastes. The reduction of gas emissions will represent an interesting environmental output. EcoFertiS will contribute to the implementation of UN Agenda 2030 for Sustainable Development.

Keywords

#biowastes

#circular_economy

#dessimination

#fertilizer_irrigation

#organic_pilot

#processing

#prototype

#soil_health

#soil_pollution



Demo sites/case studies

10 

Platforms / Hub

3 

New products and solutions:

- ✓ autorun;
- ✓ S&F software;
- ✓ recycling prototype



Thematic Area

Farming Systems



Action and Topic

RIA - Research and Innovation Action



Budget

790.100,00 €



Duration

36 months



State and Coordinator Entity

SPAIN

Universitat Politècnica de València (UPV)



UNIVERSITAT
POLITÈCNICA
DE VALÈNCIA

Scientific Coordinator:
Jaime LLORET

Participating States/ 4



Research Units/ 7



Section 2

PAVER

Precision AgriVoltaics for Carbon Neutrality Enhanced Production and Reduced Environmental Impact in Greenhouse

Context

Greenhouses are a solution to improve productivity in regions with aggressive climates. Considering climate change, an increase in extreme events is expected. Nonetheless, considering the elevated energy consumption rate in greenhouses, these systems' carbon footprint and impact are high. Implementing renewable energy sources and efficiently using resources such as water, fertilizers, or phytosanitary products, as well as designing and developing novel Artificial Intelligence analytical models, can enhance sustainability and reduce the impact of these systems.

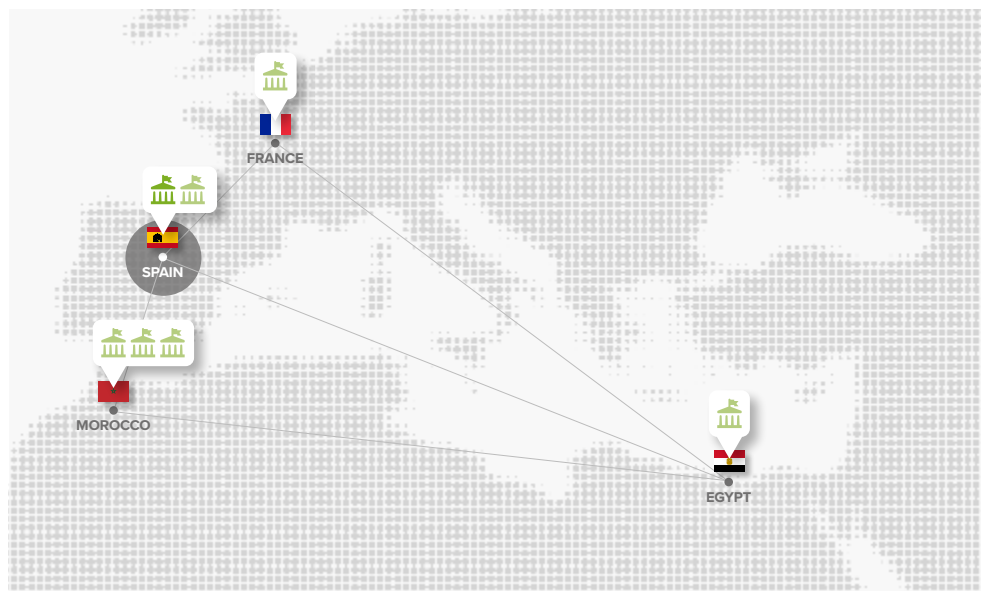
Objective and contents

The aim of this project is to design and develop an intelligent, robust, feasible and sustainable AIoT-Agrovoltaic platform/system capable of being deployed to any type of greenhouse, irrespective of climate and type of crop, in regions with limited access to the electrical grid and/or insufficient quantity/quality of irrigation water. To achieve this, under the project framework, we will implement software modules based on advanced artificial intelligence algorithms to jointly control and optimise i) the performance of photovoltaic panels, ii) the monitoring of physical parameters through sensors, and iii) operation actuators in the crop in real-time. The ultimate goal is to enhance crop efficiency and photovoltaic performance. The Overall Objective of this project is to boost the adoption of solar agrivoltaics production in cascade hydroponic greenhouses controlled by AIoT devices to reach carbon neutrality in food production. For that purpose, we define a total of 6 Specific Objectives and 13 Key Performance Indicators.

Expected impacts and results

Several efforts will be carried out to engage local stakeholders and early adopters thanks to the conduction of capacity-building activities and promotion of new business models based on the produced energies and alternative crops. The main impacts in the short term are the following:

- decrease of GHG linked to food production in cascade hydroponic greenhouses;
- reduction irrigation in areas adopting the proposed system;



Other in Consortium/ 6

Universitat Politècnica de
Cartagena (UPCT) - ES

Institut National de la Recherche
Agronomique Morocco (INRAM) -
MA

University Sultan Moulay Slimane
(USMS) - MA

STE REOWA sarl (REOWA) - MA

Green Power for Agriculture and
Irrigation (GPAI) - EG

University of Haute Alsace (UHA)
- FR

- no water pollution due to cascade hydroponic greenhouse production;
- increase of harvest of lead users;
- an increase in profitability of lead users ;
- increase of independence on conventional energy suppliers of lead users;
- new knowledge about alternative cropping methods in greenhouses;
- apparition of SMEs in developing countries that exploit our results;
- more food available in the market at affordable prices;
- small empowerment of rural people and youth.

Keywords

#cascade_hydroponic_greenhouse

#agrivoltaic

#solar_energy

#water_treatment

#AIoT

#Digital_Twin

#nutrient_and_water_recirculation

#CO2_footprint_reduction

#resources_efficiency

#sensor_and_actuator_networks



Demo sites/case studies

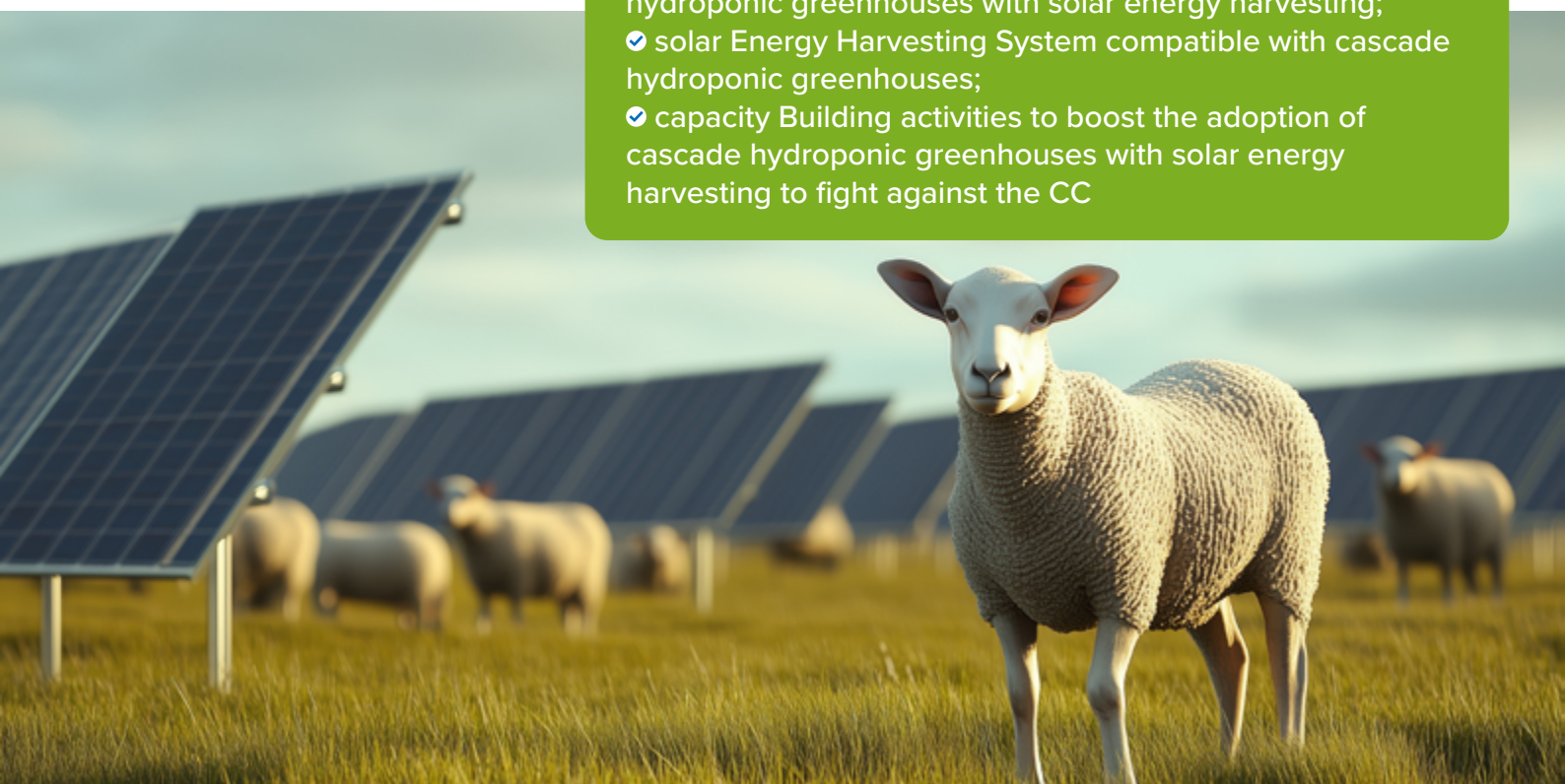
2

Platforms / Hub

1

New products and solutions:

- ✓ handbook of sustainable practices to reduce CO2 footprint of cascade hydroponic greenhouses with solar energy harvesting;
- ✓ digital Twin of a cascade hydroponic greenhouse with solar energy harvesting to test and validate the proposals;
- ✓ AIoT network included sensors and actuators in the different production systems of the cascade hydroponic greenhouses with solar energy harvesting;
- ✓ new business models for using the produced energy in the cascade hydroponic greenhouses with solar energy harvesting;
- ✓ proposal of Management practices for the cascade hydroponic greenhouses with solar energy harvesting;
- ✓ solar Energy Harvesting System compatible with cascade hydroponic greenhouses;
- ✓ capacity Building activities to boost the adoption of cascade hydroponic greenhouses with solar energy harvesting to fight against the CC



Thematic Area

Farming Systems



Action and Topic

RIA - Research and Innovation Action



Budget

603.136,00 €



Duration

36 months



State and Coordinator Entity

ITALY

University of Messina



Scientific Coordinator:
GRESTA, Fabio

Participating States/ 6



Research Units/ 7



Section 2

Sun2Fork

Sustainable greenhouse farming systems: from sun to fork

Context

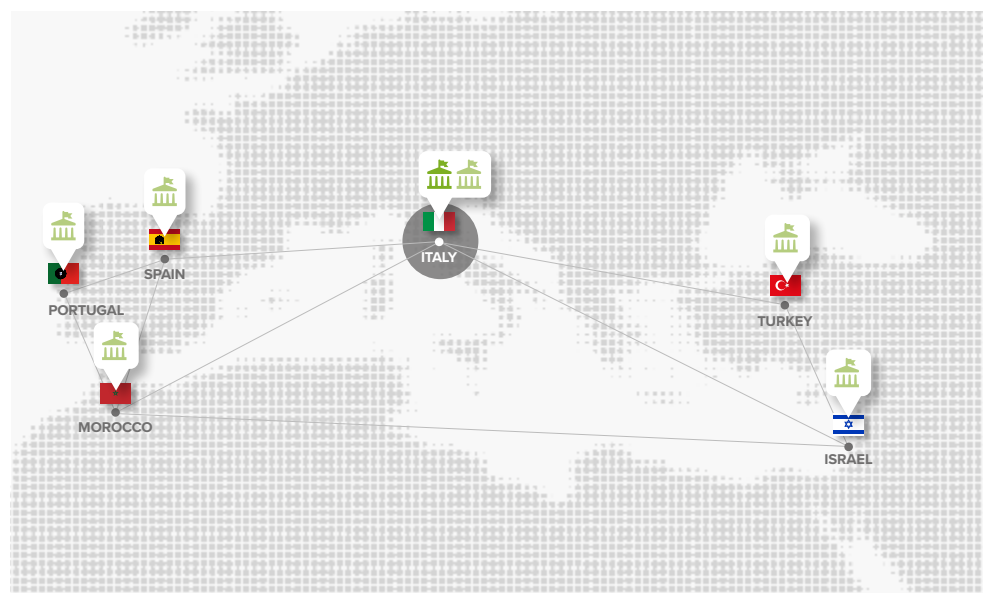
Greenhouse cultivation is one of the most important sources of vegetables and fruits. In recent years, in modern agriculture, growing in greenhouses has become more common due to the requirement of out-of-season crops. The emerging theme in greenhouse agriculture is the sustainability of the production process: in agreement with the European guidelines, the aim is to reduce the environmental impact, maintaining productivity, promoting economic viability, and saving resources and energy.

Objective and contents

This project, developed in Italy, Turkey, Israel, Morocco, Portugal, and Spain aims to realise an eco-friendly greenhouse farming system in the Mediterranean area, through the combination of technological innovations and sustainable resources with a WEFE Nexus approach. The specific objectives of the project involve i) the maximization of the efficiency of organic and hybrid photovoltaic solar panels through the optimization of the trade-off between transparency and efficiency, ii) the development of integrate sensors for climate control, irrigation and fertilization by means of artificial-intelligence and deep learning, iii) the optimization of management techniques (alternative substrates, resilient species and varieties, biostimulants and recirculation irrigation system) the maximization of crop performance and reduction of wastes in soilless systems, iv) the evaluation of the integrated life cycle sustainability assessment, covering all pillars of sustainability.

Expected impacts and results

Overall, Sun2Fork will increase the availability of water resources through the development of an efficient irrigation model based on artificial intelligence to reduce water waste. New protein hydrolysates, plant growth-promoting bacteria, and sustainable crop cultivation in closed hydroponic systems will contribute to a reduction in water and fertilizer consumption, thereby reducing the pollution of water resources. New local organic substrates will help growers to save money, produce healthy plants, and contribute to sustainable agricultural practices. The novelty of Sun2Fork is therefore



Other in Consortium/ 6

University of Roma Tor Vergata
(UniTov) - IT

Agricultural Research Organization
Volcani Center (ARO) - IL

University of Sultan Moulay
Slimane (USMS) - MA

Universidade Católica Portuguesa
(UCP) - PT

Universidad de America (UAL) - ES
Ege University (EGE) - TR

the agroecological cultivation techniques of vegetable crops in greenhouses to reduce chemical and water use coupled with the integration of devices and sensors for an effective management.

Keywords

#greenhouse

#solar-powered

#sustainability

#water_reuse

#hydroponic

#climate_monitoring

#eco-friendly_substrates

#biostimulants



New products and solutions:

- ✓ AI-based system trained on agronomic and water-management datasets;
- ✓ eco friendly substrates;
- ✓ biostimulant based on protein hydrolysate



Thematic Area

Farming Systems



Action and Topic

RIA - Research and Innovation Action



Budget

1.209.722,00 €



Duration

36 months



State and Coordinator Entity

ITALY

University of Bologna (Alma Mater Studiorum Università di Bologna)



ALMA MATER STUDIORUM
UNIVERSITÀ DI BOLOGNA

Scientific Coordinator:

COSTA, Angela

Participating States/ 6



Research Units/ 10



Section 2

SUPREM-MILK

Towards a more sustainable and resilient Mediterranean milk supply chain

Context

SUPREM-MILK aims to provide concrete tools and propose customized and targeted solutions that can support farmers of the Southern Mediterranean area to take a step towards a net zero carbon. A greener and more circular “farming” will be achieved through actions that maximise the 3 forms of sustainability and the resilience of the Mediterranean milk supply chain. The 3 pilot areas will be: Egypt, Morocco, and Turkey.

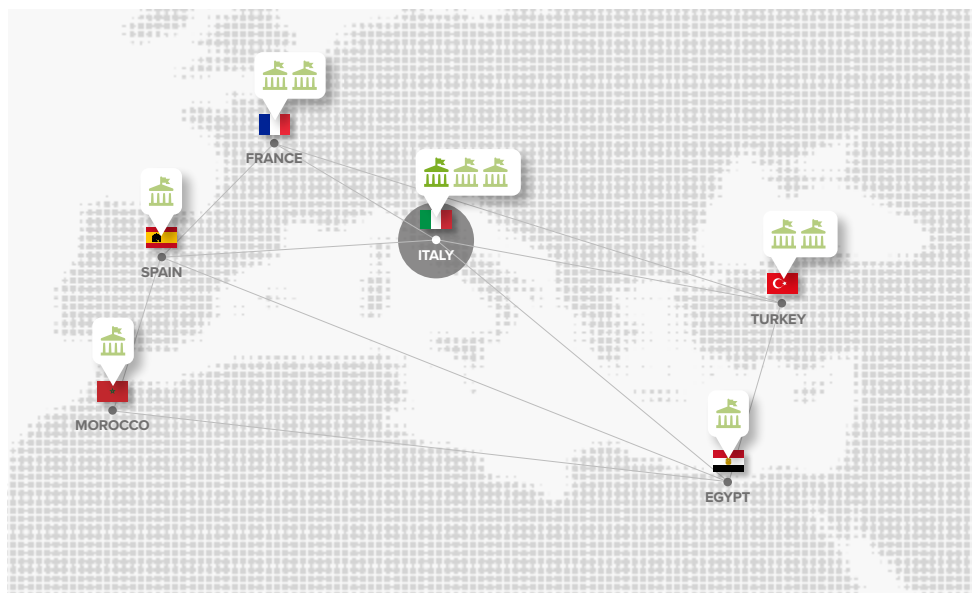
Objective and contents

The specific objectives are:

- START POINT, identification of desired direction(s) adopting a multi-actor approach. Preliminary inventory of the carbon cycle and characterization of sustainability in the 3 ecosystems (Egypt, Morocco, and Turkey). Performance indicators of animals (input and output) as well as information about manure management and constraints, life cycle assessment of milk, soil health and land use will be retrieved from public and private databases and elaborated to evaluate the starting point of different scenarios;
- CORE, support the adoption and implementation of sustainable technologies, novel applications and best practices by local farmers. Transfer of knowledge, establishment of decision-support systems, and installation of hi-tech tools;
- END-POINT, final assessment of carbon balance, sustainability, self-sufficiency, and competitiveness following an horizontal integrated approach, from farm to fork: soil, water, animals, producers, and consumers

Expected impacts and results

- ↓ CO2-equivalent emissions by using alternative sources (Reduction of external use of entrants, Sustainable practices applied in terms of soil and manure management, Local milk chain self-sufficiency)
- ↑ efficient use of water, fertilizers, and nutrients in Mediterranean farming systems by adopting a circular bio-economy approach (Tailored best practices, Reduction of milk production costs, Smart use of manure according to its properties, Campaign for



Other in Consortium/ 9

Università di Napoli Federico II - IT

ANASB Associazione Nazionale

Allevatori Specie Bufalina - IT

INRAE UMR SADAPT - FR

Unilasalle - FR

İstanbul Üniv. Cerrahpaşa Avcılar

Kampüsü - TR

Ankara University - TR

ARRI Animal Reproduction

Research Institute- EG

Ibn Tofail University - MA

Asociación para la investigación

de la industria del Juguete,

conexas y afines - ES

carbon footprint and circular economy sensitivity)

↑ land productivity (APP for manure and soil management)

↓ impacts of climate change on Mediterranean farming systems (Reduction of GHG, Biophysical assessments of soil ecosystem services, Breeding programs and selected genotypes for heat tolerance, Farmers' knowledge of soil erosion mechanisms)

Demo sites/case studies

3 

Platforms / Hub

3 

New products and solutions:

- ✓ best practices for soil health;
- ✓ APP for farmers;
- ✓ mating plans;
- ✓ booklet for animal management;
- ✓ LCA of milk;
- ✓ campaigning for milk consumption



Thematic Area

Agri-food Value Chain



Action and Topic

RIA - Research and Innovation Action



Budget

1.109.000,00 €



Duration

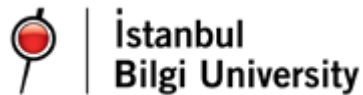
36 months



State and Coordinator Entity

TURKEY

Istanbul Bilgi University



Scientific Coordinator:
Gülşen BETÜL AKTAS

Participating States/ 5



Research Units/ 7



Section 2

A-BLOCK

Nano-Enabled Antimicrobial Food Packaging Incorporating Natural Bioactives from Mediterranean Agri-Wastes

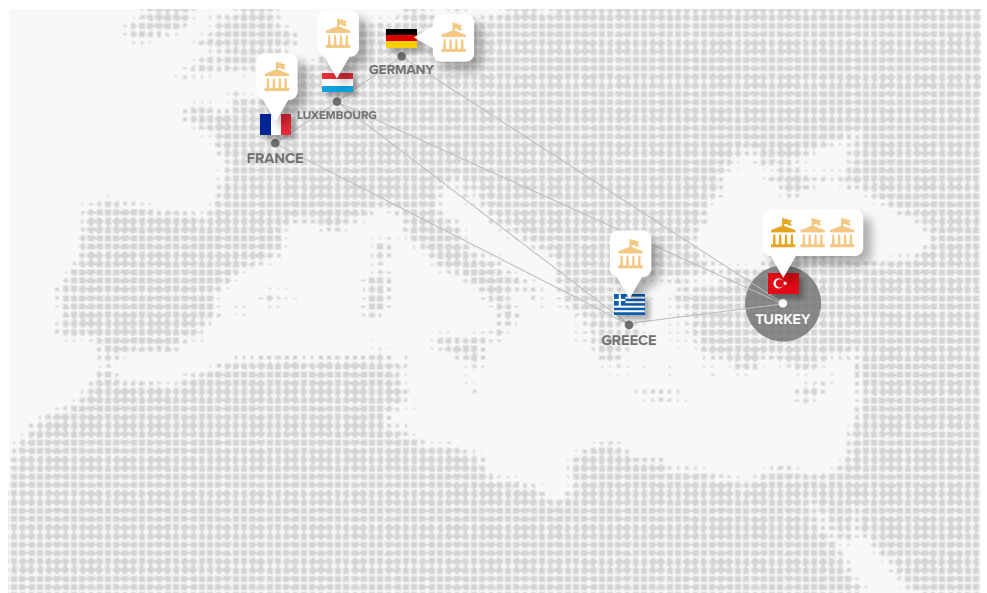
Context

The worldwide paradox of addressing food security through agricultural measures even as a third of all food produced is wasted, stands to threaten the economic and the environmental balance and sustainability. In this direction, A-BLOCK aims at novel antibacterial food packages that promises reduction in food loss, extending food's shelf life, enabling food preservation in supply chains to remote areas and improved consumer safety. The developments factor in the end user specifications and sustainability principles from the outset by fostering recyclability, avoiding harmful chemicals, choosing natural, bio-sourced materials, and adopting biomimetic approaches.

Objective and contents

The main objective of A-BLOCK is to develop novel antimicrobial food packaging films to inhibit or retard the growth of microorganisms that cause food decomposition and thereby enhancing food safety, extending shelf-life and reducing food wastage. To achieve this, A-BLOCK plans to incorporate different strategies including encapsulation and release of natural antimicrobial/antioxidant (AM/AO) agents derived from agri-waste from Mediterranean countries and creating nanostructures that can deter the growth of bacterial biofilms. The films will be continuously tested for their antibacterial performance, and the selected packages will be validated and benchmarked using raw cut meat products and cake. Continuous feedback from the packaging industry partner in the consortium ensures the choice of materials and processes are manufacturing compatible. The involvement of the food processing company would ensure adequate benchmarking of the performance of the films against existing products in the market.

A-BLOCK's development aims at innovation in encapsulation and release technologies, production of nanostructured coatings on food packaging films, and tools/approaches to accelerate testing and optimization of antibacterial coatings. The choice of recyclable plastic packaging films, use of scalable processes, use of coatings that are known to be food-compatible, and raw materials that are biosourced, are all directed at meeting sustainability goals of the A-BLOCK consortium.



Other in Consortium/ 6

Ülker Bisküvi -TR

Polinas Plastic Company - TR

University Claude Bernard Lyon -
FR

Institute of Food Technologies - DE

National and Kapodistrian
University of Athens - GR

Luxembourg Institute of Science
and Technology - LU

Achieving the fundamental ability to control microbial growth on different packaged food products will be a potential breakthrough for active packaging systems, replacing the synthetic chemicals and preservatives used in conventional products. We aspire to grasp the opportunity to create novel bioactive packaging systems that brings the best of food quality preservation while incorporating sustainability principles.

Expected impacts and results

A-BLOCK will use an interdisciplinary approach, including engineering, natural products chemistry, materials science, food technology, and microbiology bringing together stakeholders from academia and industry with demonstrated knowledge and experience in the science and precise technology areas critical to the success of the project. The research and development part of A-BLOCK will start at Technology Readiness Level (TRL) 2 with the formulation of the concept and will reach up to TRL 4 (with prospects of reaching TRL 5) as the actual system will be proven both in the laboratory and in an operational environment by the industrial partners. All materials used in the project will be selected and processed to give the highest priority to consumer safety (non-toxic, food compatible) and sustainability principles.

Demo sites/case studies

2 

Keywords

#sustainable_food_chain

#natural_antimicrobial_agents

#food_safety

#active_food_packaging

#diatoms

#microemulsions

#microcapsules

#nanotopography

#biomimetic_nanopillars

#mediterranean_agri-wastes

New products and solutions:

- ✓ antimicrobial food packaging for the extension of shelf-life;
- ✓ reduction of food losses



Thematic Area

Agri-food Value Chain



Action and Topic

RIA - Research and Innovation Action



Budget

1.401.031,00 €



Duration

36 months



State and Coordinator Entity

ITALY

University of Salerno (UNISA)



UNIVERSITÀ DEGLI STUDI
DI SALERNO

Scientific Coordinator:
DONSI, Francesco

Participating States/ 6



Research Units/ 13



Section 2

AgriBioPack

Valorizing Agrifood Residues for Bio-based Packaging Solutions

Context

The research explores the potential of agrifood residues, particularly from Mediterranean crops like olives and grapes, as sources of valuable compounds for bio-based packaging. Through intensive processing and microbial fermentation, innovative conversion systems can produce cost-effective materials like microbial cellulose. The aim is to enhance existing bio-based packaging by integrating extracts from agrifood residues, addressing technological challenges like controlling food microbiomes and ensuring product safety and sustainability.

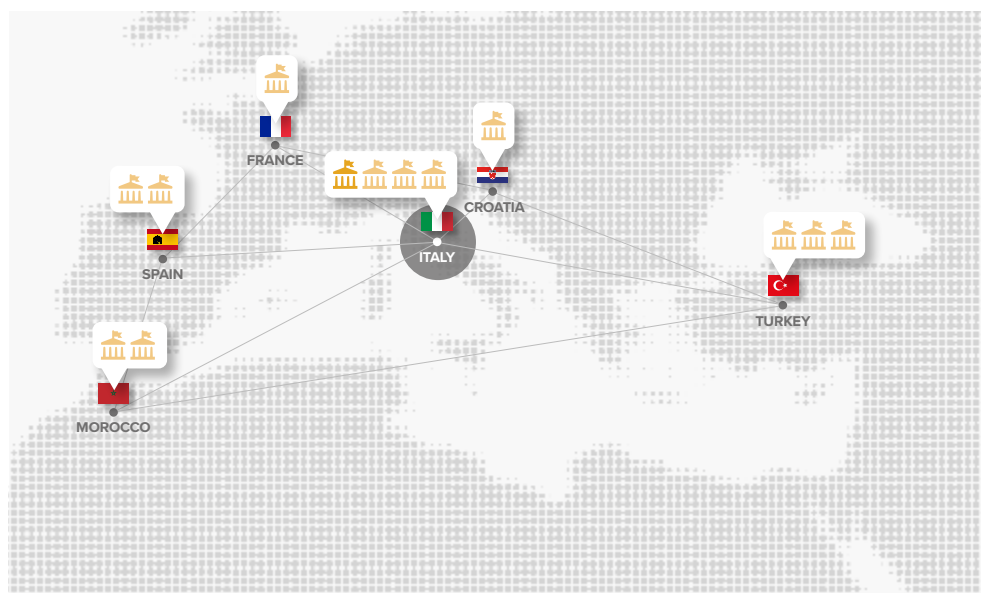
Objective and contents

The AgriBioPack project aims to develop bio-based active packaging solutions for Mediterranean products, enhancing marketability by extending shelf life and reducing food waste. Specific objectives include identifying promising agrifood residues, extracting biopolymers and bioactive compounds, exploring alternative production routes, optimizing packaging formulations, evaluating performance, integrating ICT solutions for data analysis and monitoring, and assessing environmental and cost effectiveness. Through carefully controlling planning and execution, the project seeks to advance sustainable packaging solutions and valorize agrifood residues, benefiting Mediterranean communities.

Expected impacts and results

Aiming at developing new vegetable-based products active on chronic diseases (i.e., AgriBioPack expected results and impact:

- environmental Impact Reduction: Sustainable packaging from agrifood residues will cut greenhouse gas emissions;
- enhanced Food Safety & Waste Reduction: Novel antimicrobial packaging will boost shelf life, reducing food waste;
- sustainable Antimicrobial Solutions: Decreased reliance on synthetic additives, lowering the carbon footprint;



Other in Consortium/ 12

University of Perugia - IT

Sant'Anna School of Advanced Studies - IT

X-Team srl- IT

Istanbul Technical University - TR

Ege University - TR

Yeditepe University - TR

National School of Agriculture, Meknès - MA

Université Mohammed V de Rabat - MA

Lleida University - ES

University of Granada - ES

University of Technology of Compiègne - FR

University of Split - HR

- natural Antimicrobial Agents Valorization: Promoting sustainable practices with phenolic compounds and essential oils;
- collaborative Database Development: Mapping feedstock availability, optimizing extraction, fostering sustainable practices;
- microbiome-Based Innovation: Advancing microbiome approaches for prolonged food shelf life, reducing chemical use;
- innovative Product Prototypes: Creating consumer-centered, high-quality food products with extended shelf life, opening new market opportunities;
- workforce Growth: Stimulating a 10% workforce increase in packaging companies, promoting gender equality;
- health & Innovation Promotion: Disseminating traditional products, amplifying health benefits, influencing policymakers for potential food policy changes.

New products and solutions:

- ✓ Multicenter Database for agrifood residues from the Mediterranean area for the recovery of bioactive compounds;
- ✓ development of films and coatings based on natural extracts and biopolymers for controlling the microbiome of food products;
- ✓ Smartphone-Based Colorimetric Detection Application;
- ✓ Business Model Development



Thematic Area

Agri-food Value Chain



Action and Topic

RIA - Research and Innovation Action



Budget

1.086.370,00 €



Duration

36 months



State and Coordinator Entity

SPAIN

Universidad de Córdoba (UCO)



Scientific Coordinator:
ESPINOSA, Eduardo

Participating States/ 7



Research Units/ 10



Section 2

BIOMEDPACK

Technological and economic potential of the active packaging obtained by supercritical techniques for the preservation of Mediterranean fresh food

Context

Food waste in the EU (100 million tons) contributes to 17% of direct greenhouse gas emissions (over 170 million tons of CO₂) and 28% of material resource use. BIOMEDPACK aims to address this challenge by developing sustainable, bio-based active packaging solutions for the Mediterranean region. These solutions utilize circular valorization of agricultural by-products through advanced biorefinery systems, aiming to extend shelf life and reduce waste.

Objective and contents

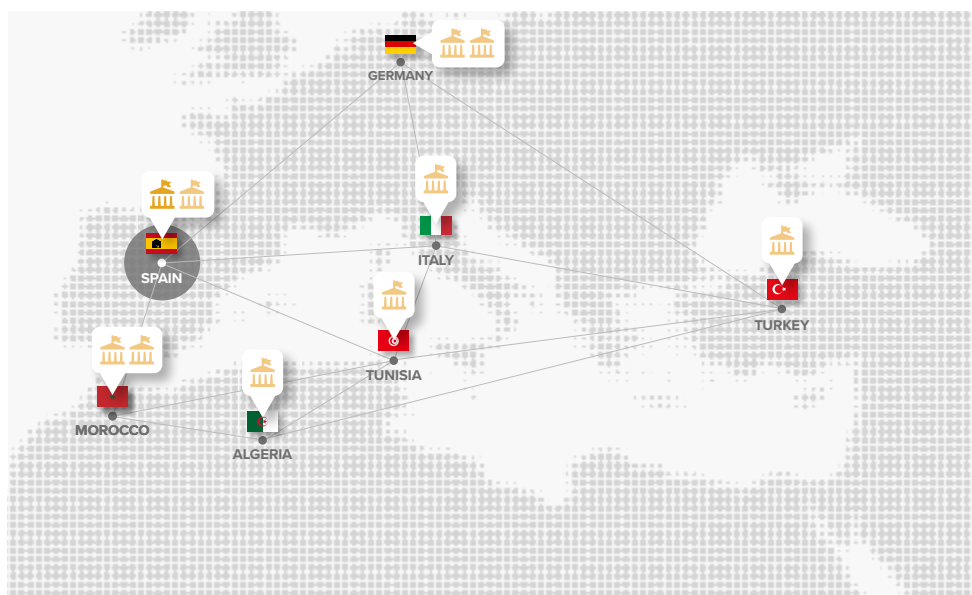
The BIOMEDPACK project aims to create scalable, sustainable packaging and bio-preservation solutions tailored for the Mediterranean region. It focuses on valorizing agricultural by-products' lignocellulosic and bioactive components, leveraging food microbiome data and computational techniques. Specific objectives include:

- advancing socio-economic development by establishing small-scale biorefineries for circular production of bio-based active packaging;
- developing Multi-Product Cascade Biorefinery processes to efficiently valorize diverse agricultural by-product fractions;
- creating microbiome-guided active packaging systems using biopolymers, bioactive compounds, and microbial consortia to enhance food product shelf-life, quality, and nutrition;
- scaling up bio-based packaging systems and assessing their efficacy across the postharvest food chain, considering technical feasibility, environmental impact, and market validation.

Expected impacts and results

BIOMEDPACK's implementation is poised to significantly advance sustainability and efficiency in the Mediterranean agri-food industry. Key outcomes include:

- establishing a comprehensive stock of Mediterranean by-products and analyzing their suitability for valorization;



Other in Consortium/ 9

PackBenefit S.L. (PB) - ES

University of Freiburg (UFR) - DE

Computomics (COMPU) - DE

Mohammed VI Polytechnic

University (UM6P) - MA

Université Cadi Ayyad (UCA) - MA

Université Frère Mentouri-

Constantine 1 (UFMC1) - DZ

University of Turin (UNITO) - IT

Université de Sfax (US) - TN

GTE Sustainability and Energy

Consultancy (GTE) - TR

- formulating a socio-economic strategy to expedite local biorefinery establishment for sustainable utilization;
- enhancing understanding of post-harvest microbiome dynamics in Mediterranean foods, improving food safety and quality;
- developing an advanced in vitro/in silico platform integrating computational models for high-throughput analysis;
- identifying microbial consortia as biopreservation agents;
- validating natural antimicrobial agents for meat and fish preservation, reducing reliance on chemicals.
- creating and evaluating active, sustainable packaging systems meeting market needs;
- devising preservation systems enhancing vegetable shelf life and nutritional properties.
- conducting comprehensive sustainability assessments to ensure alignment with broader environmental and social goals.

Keywords

#active_packaging

#biorefinery

#valorisation

#shelf-life

#microbiome_dynamics

#computational

#food_by-products



New products and solutions:

- ✓ fiber-based trays;
- ✓ edible coatings;
- ✓ bio-based films;
- ✓ adsorbent pads;
- ✓ halochromic indicators



Thematic Area

Agri-food Value Chain



Action and Topic

RIA - Research and Innovation Action



Budget

1.186.544,00 €



Duration

36 months



State and Coordinator Entity

SPAIN

Universidad de Córdoba (UCO)



Scientific Coordinator:
GARCÍA, Arceli

Participating States/ 7



Research Units/ 8



Section 2

DurlInnPack

Innovative Packaging and edible coatings to guarantee post-harvest Durability of Mediterranean fruits and vegetables production

Context

Fruits and vegetables make a significant contribution to nutrition and poverty reduction, as well as to generating global economic development. Unfortunately, high levels of post-harvest losses and damages (PHL and PHD) have been the main bottlenecks in fresh food supply chains for years. Despite the important scientific and technological advances in the field of food loss prevention, as well as the general interest in the circular economy and waste-free production processes, there are not enough packaging solutions with potential applicability in the Mediterranean areas

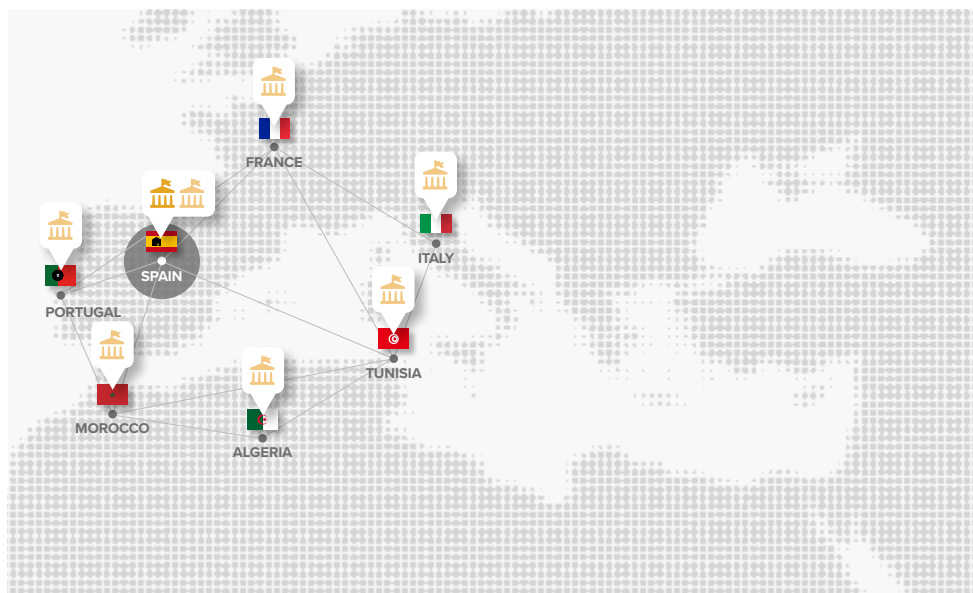
Objective and contents

Our general objective is to develop effective food packaging solutions able to reduce vegetables PHL/PHD improving their durability during harvesting, storage, and transport activities. DurlInnPack focuses on developing innovative edible coatings, produced from sustainable and renewable Mediterranean sources, capable to reduce PHL/PHD and increase the profits of the agro-food producers, offering to the final consumer an improved product.

To achieve this, DurlInnPack manages: (1) Reuse of agrifood residues; (2) Edible coating with antimicrobial activity; (3) Lasting food protection over time; (4) Prevent bruising and cracking during storage; (5) Emulsions/spray solutions as easy to apply packaging solutions; (6) Life Cycle Analysis; (7) Economic Assessment; (8) Social Assessment; (9) Adaptation to food market requirements and (10) Emergence of new food products, offering of new sustainable products to final consumer, with improved qualities (flavour, texture, health benefits) thus instilling in producers/consumers the responsible use of non-plastic packaging.

Expected impacts and results

Scientific results and socioeconomic impacts of DurlInnPack are: (1) packaging solutions based on agrifood residues (2) coatings allowing safer storage/transport, minimizing PHL/PHD, with a clear benefit along the agri-food chain (3) keeping nutritional



Other in Consortium/ 7

Consejo Superior de
Investigaciones Científicas (CSIC)
Estación Experimental del Zaidin
(EEZ) - ES

Centre de Recherche Scientifique
et Technique en Analyses Physico-
chimiques - DZ

University of Grenoble Alpes
(LGP2 INP) - FR

University of Milano (UNIMI) - IT

Université Mohammed Premier
Oujda (UMP) - MA

Instituto Politécnico de Bragança
(IPB) - PT

Institute of Technological Studies
of Ksar Hellal (ISETKH) - TN

integrity along the food pipeline (from producer to consumer), with prebiotic benefits and novel taste/textures of transformed products (4) offering to SME and farmers a tool to improve harvesting profit (5) potential transference for social development and poverty reduction (6) balanced territorial development, replicable at Mediterranean territories, fostering resilience and competitiveness of agricultural sector and allowing economic development reducing dependence on non-Mediterranean markets (7) boosting of Mediterranean agrifood sector with sustainable innovation actions (8) coatings avoiding crops deterioration during growth and ripening.

Keywords

#food_durability

#food_safety

#antimicrobial_activity

#LCA

#bio-resources_polymers

#edible_coatings

#senescence

#nutritional_and_organoleptic_properties

#postharvest_losses

#physic-mechanical_damage

#ripeness

#spray-on_solutions



New products and solutions:

- ✓ spray-on edible coatings for vegetables/fruits protection



Thematic Area

Agri-food Value Chain



Action and Topic

RIA - Research and Innovation Action



Budget

1.559.053,96 €



Duration

36 months



State and Coordinator Entity

SPAIN

Consejo Superior de Investigaciones Científicas (CSIC)



Scientific Coordinator:
FABRA, María Jose

Participating States/ 8



Research Units/ 10



Section 2

EVOLVEPACK

dEsign, processing and characterisation of innoVative biOdegradable and compostable active PACKaging structures to improve food safety of Mediterranean foods.

Context

The project Consortium is composed of 10 Partners from 8 different countries, covering a range of complementary competences and skills, aligned with the European Strategy for Plastics in a Circular Economy from 2018, which seeks to contribute to one of the Sustainable Development Goals (SDGs) from the United Nations, related to prevention and reduction of marine contamination, promoting the use of more sustainable materials.

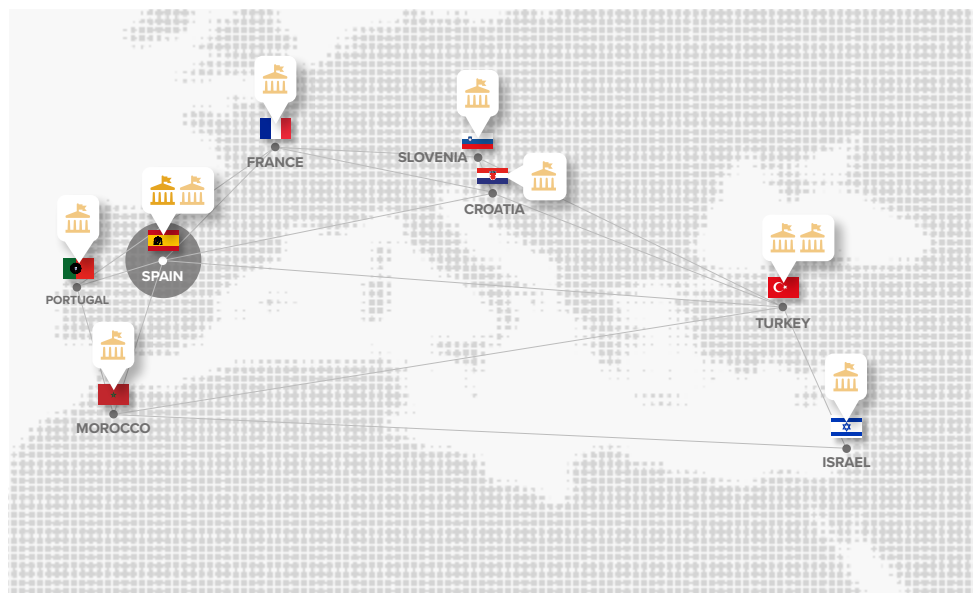
EVOLVEPACK will be executed over 36 months with a total budget of € 1.998.553,22 requesting a public contribution of € 1.559.053,96. The project will generate broad scientific-technological knowledge (TRL 4) and develop applicable solutions (TRL 6-7), under an overall approach structured in 8 Work Packages.

Objective and contents

The overall objective of the EVOLVEPACK project is to design and produce innovative, cost-effective, compostable and/or recyclable food packages based on active bioplastics and cellulosic materials. Trays, flexible films and absorbing pads will be developed considering a circular economy strategy.

A thorough analysis of the antimicrobial packaging structures in terms of composition, antimicrobial characteristics, safety assessment and validation in food products will be carried out. These materials will be used to pack fruit/ vegetables and fish, which are the basis in the Mediterranean diet, but are prone to rapid deterioration.

Migration studies will be performed to assess the food safety of the developed concepts. Quantitative and non-quantitative constraints such as processability, consumer acceptance food safety, among others, will be considered in order to facilitate the design of sustainable packaging structures based on a requirementdriven approach. EVOLVEPACK will also provide an answer to society's concerns related to food safety, environmental and economic circularity issues of the food industry and food packaging in the Mediterranean region.



Other in Consortium/ 9

TECSELOR - ES

Tarsus University - TR

**Camusfish su ürünleri san. Ve tic.
Ltd. Sti - TR**

University of Zagreb - HR

University of Bourgogne - FR

**Agricultural Research Organization
- IL**

ENCG-Tanger/University

Abdelmamel Essaadi - MA

**Universidade Católica portuguesa,
Porto - PT**

Pulp and Paper Institute - SL

Expected impacts and results

The project Consortium is composed of 10 Partners from 8 different countries, covering a range of complementary competences and skills, aligned with the European Strategy for Plastics in a Circular Economy from 2018, which seeks to contribute to one of the Sustainable Development Goals (SDGs) from the United Nations, related to prevention and reduction of marine contamination, promoting the use of more sustainable materials.

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Thematic Area

Agri-food Value Chain



Action and Topic

RIA - Research and Innovation Action



Budget

1.751.524,00 €



Duration

36 months



State and Coordinator Entity

TUNISIA

Center of Biotechnology of Borj Cédri (CBBC)



Scientific Coordinator:
TRABELSI, Najla

Participating States/ 10



Research Units/ 18



Section 2

FoWRSaP

Agro Food Waste Recovery: new processing technologies for food Safety and Packaging

Context

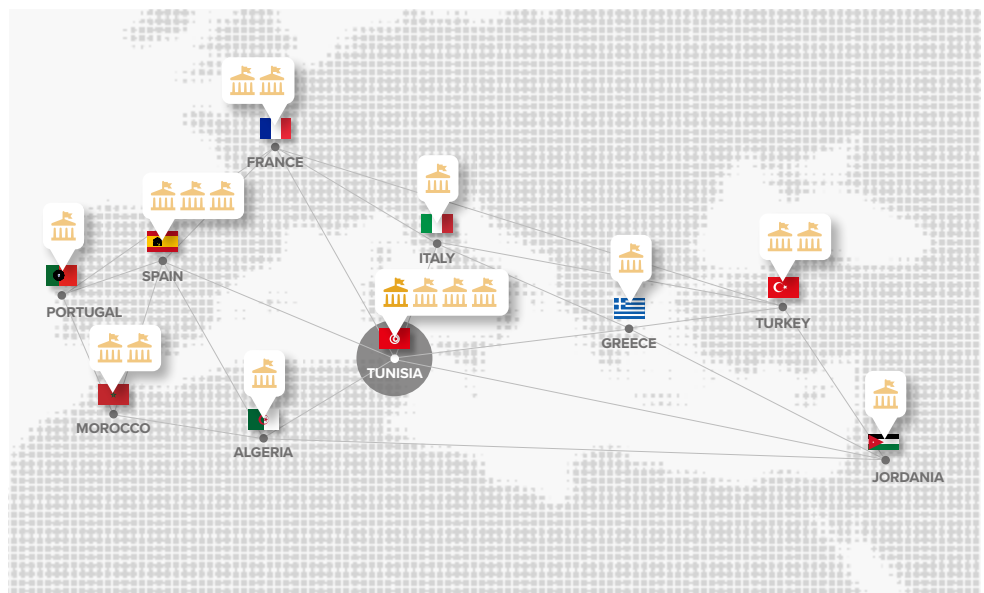
SDG 2, Zero Hunger, is crucial for the food sector as the global population is projected to reach 10 billion by 2050. The FoWRSaP project pioneers sustainable bio-packaging using biopolymers (chitosan, polylactic acid), addressing plastic waste and enhancing food shelf life. By replacing synthetic materials with biodegradable alternatives, it tackles environmental threats and improves food protection. The project integrates natural antimicrobial compounds from olive and date by-products into packaging, extending shelf life and reducing spoilage. This innovative approach supports sustainability in the agro-food industry, promoting eco-friendly packaging solutions for a greener future.

Objective and contents

FoWRSaP is transforming food packaging in the Mediterranean by utilizing advanced biopolymers such as chitosan, polylactic acid, and exopolysaccharides to promote sustainability and enhance food safety. The project integrates natural extracts from olive and date by-products, as well as plant microbiomes, into packaging to extend shelf life and reduce environmental impact. Key technologies include electrospinning, extrusion, and paper sensors for aflatoxin detection.

FoWRSaP focuses on developing biodegradable packaging while emphasizing sustainable practices, stakeholder engagement, biomass utilization, and circular economy strategies to establish a replicable bio-based value chain. The project will create living labs for real-world testing and refinement of packaging prototypes, ensuring that solutions meet diverse stakeholder needs. Comprehensive Life Cycle Assessments (LCAs) and Life Cycle Costing (LCC) analyses will evaluate the economic, environmental, and social impacts, providing insights into the sustainability benefits of biopolymer-based packaging.

Additionally, the project aims to valorize olive and date waste, advancing antimicrobial bio-packaging and biosensors for food safety. FoWRSaP's emphasis on industrial engagement and international partnerships seeks to foster innovation and sustainable practices in the agro-food sector. Ultimately, FoWRSaP aims to set new standards



Other in Consortium/ 17

National Center for Nuclear Sciences and Technologies - TN

Boudjebel SA VACPA - TN

Sté AGRI-LAND - TN

Centro Tecnológico da Carne - ES

Miguel Hernández University - ES

SURINVER S. COOP - ES

Centre Technique Industriel de la Plasturgie et des Composites - FR

Université Bretagne sud - FR

Hassan II University of Casablanca - MA

University Mohamed Premier-Oujda - MA

Tarsus University - TR

Middle East Technical University - TR

University of Bejaia - DZ

The Hashemite University - JO

Aristotle University of Thessaloniki - GR

University of Pisa (UNIPI)- IT

Polytechnic Institute of Bragança - PT

for food safety, environmental stewardship, and economic viability in the global agro-food industry, paving the way for a sustainable future.

Expected impact and results

The FoWRSaP project is set to revolutionize the agro-food industry with significant impacts. It aims to enhance food quality and safety by reducing microbial contamination by 50% and increasing shelf life by 30%. This will be achieved through advanced biosensors and smart packaging systems, promoting high adoption rates among stakeholders. The project expects to cut market prices for biopolymers by 20% through green extraction methods, making them more accessible and affordable.

FoWRSaP also targets a 20% reduction in agro-food industry waste and a 15% increase in by-product valorization, supporting a circular economy. It aims to reduce chemical solvent use by 50%, cut chemical waste by 20%, and decrease agro-food waste by 25%, all contributing to environmental sustainability.

Additionally, the project introduces bio-based packaging materials to lower food spoilage and boost consumer preference for eco-friendly products. This approach reduces reliance on chemical treatments, preserving food quality and supporting healthier options.

FoWRSaP promotes inclusive growth by increasing women's representation in the agro-food sector and offering training programs to support gender equality. Overall, FoWRSaP's innovative and sustainable practices promise to enhance food safety, reduce waste, and foster economic resilience, setting a new standard for the industry.

Keywords

#bio-polymers

#valorisation_of_by-products

#green_extraction

#natural_compounds

#antimicrobial_potential

#food_products

#active_bio-packaging

#smart_bio-packaging

#bio-sensor

Demo sites/case studies



New products and solutions:

- ✓ microbiome based packaging;
- ✓ biofilms with enhanced antimicrobial activity;
- ✓ smart biosensor- based packaging

Thematic Area

Agri-food Value Chain



Action and Topic

RIA - Research and Innovation Action



Budget

1.620.574,00 €



Duration

36 months



State and Coordinator Entity

FRANCE

Université de Montpellier

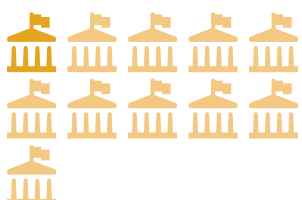


Scientific Coordinator:
GUILLARD, Valérie

Participating States/ 9



Research Units/ 11



Section 2

INTACTBioPack

INTelligent, ACTive MicroBIOme-based, biodegradable
PACKaging for Mediterranean food

Context

The Mediterranean Sea, is polluted by an estimated 730 tonnes of plastic waste every day, mostly single-use plastics, e.g., packaging. Meanwhile, this region is suffering, as elsewhere in the world, of high amount of food waste and loss (about 1/3 of the production, FAO 2021) but this rate generates, like nowhere else, unacceptable economic & environmental costs. Although much evidence of usage benefit of applying antimicrobial packaging or intelligent sensor (e.g., RFID biosensor) for extending food shelf-life exists, these solutions remain difficult to market because they require to be clearly fit to the specific needs of the food.

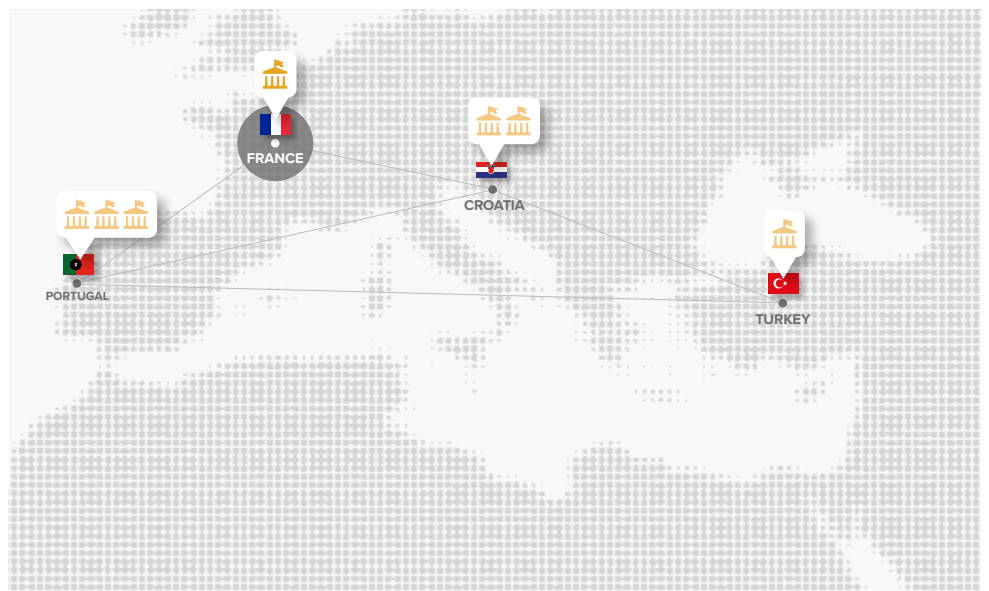
Objective and contents

In this context, INTACTBioPack aims to foster the adoption by the Mediterranean region, of novel, cost-competitive, biodegradable, and reusable food packaging solutions by:

- developing innovative home-compostable food-packaging materials, covering the dual functions of protective barrier and active food ingredient, as well as a reusable sensor (vegetal layer coupled with low-cost RFID) and colorimetric sensor to monitor food freshness during storage and at home;
- exploring the potentialities of bio- and microbiome-based solutions to design alternatives to synthetic/chemical based-solutions, and to develop consumer "self-packaging" solutions to preserve or upcycle at-home leftovers or unconsumed but still edible raw fresh produce;
- enabling a general strategy for designing safe, sustainable, and efficient biodegradable, active packaging solutions by the deployment of generalised methodologies, mathematical tools, business plans and guidelines.

Expected impacts and results

- Novel formulations of biopolyester-based composites, blends, or coatings with in-



Other in Consortium/ 10

Centre Technique de l'Emballage et du Conditionnement-PackTec - TN

Institut National Agronomique de Tunisie (INAT) - TN

Yörüksüt A.Ş. (YORUK) - TR

Tarsus University (TU) - TR

Université Mouloud Mammeri de Tizi-ouzou (UMMTO), Laboratoire Qualité Sécurité des Aliments - DZ

University of Zagreb, Faculty of Food Technology and Biotechnology (UNIZG-PBF) - HR

Nile University (NU) - EG

Consiglio Nazionale delle Ricerche – Istituto di Scienze delle Produzioni Alimentari (CNR-ISPA) - IT

New University of Lisbon, Institute of Chemical and Biological Technology (ITQB NOVA) - PT

Institute of Agrochemistry and Food Technology, Spanish National Research Council (IATA-CSIC) - ES

- intrinsic active functionalities or with added natural anti-microbials, tailored to optimise usage benefit, food shelf-life and ultimate biodegradation;
- new predictive tools to design safe and efficient anti-microbial packaging solutions;
 - development of best practice recommendations and effective dissemination such as trainings to the food and packaging stakeholders including citizens;
 - reusable battery-free RFID system coupled with bio-based sensor to track food freshness at home;
 - low-cost colorimetric sensor for easy tracking of food freshness using naked-eye;
 - a Stakeholders' Advisory Platform for promoting the diffusion of innovative sustainable packaging solutions in the Mediterranean region;
 - a mapping of the preferences, acceptances, and expectations of stakeholders of the food packaging chain including citizens;
 - up-scaled production of a selection of innovative biodegradable, microbiome-based and smart packaging solutions.

Keywords

#active_packaging

#RFID_based_bio-sensors

#colorimetric_sensor

#biopolyesters

#mediterranean_food

#microbiome-based_coatings



New products and solutions:

- ✓ one available predictive mathematical models coupling mass transfer models to the dynamics of microbiome;
- ✓ intelligent packaging: tune-up RFID prototype, scalable, adjustable by the consumer himself + its user-friendly smartphone application and working prototypes of colorimetric sensor tailored for packed fish and seafood;
- ✓ one upscaled encapsulation strategy and one upscaled compounding or coating strategy (batch of 2-5 kg) at TRL5/6, 2 materials formulation at TRL5/6 (about 20-50 packaging trays or sheets) for food shelf-life validation;
- ✓ one Stakeholders' Advisory Platform with 30 stakeholders

Thematic Area

Agri-food Value Chain



Action and Topic

RIA - Research and Innovation Action



Budget

1.442.971,00 €



Duration

36 months



State and Coordinator Entity

ITALY

University of Naples Federico II (UNINA)



Scientific Coordinator:
PISCITELLI, Alessandra

Participating States/ 6



Research Units/ 9



Section 2

MATE4MEAT

Sustainable and antimicrobial MATERIALS for MEAT packaging

Context

The current standards for food packaging emphasise high quality and safety throughout the supply chain, and the use of environmentally friendly materials. There is a growing urgency to adopt biodegradable, active, and sustainable packaging solutions that not only promote food preservation but also mitigate plastic waste accumulation. In the context of fresh meat packaging, it should preserve the food matrix, its chemical and physical quality, and minimise the presence of spoilage microorganisms

Objective and contents

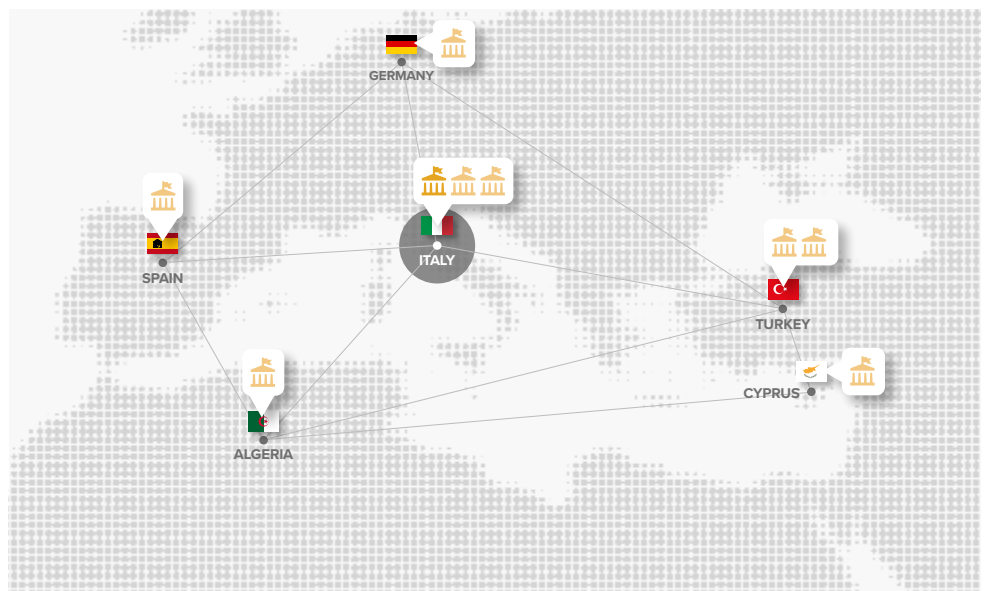
The main objective of MATE4MEAT is to enhance research and innovation capabilities and develop knowledge and innovative solutions for Mediterranean agro-food systems, aimed at preventing red meat spoilage and extending its shelf life. The project aims to develop safe and environmentally friendly alternatives to conventional plastic packaging materials. This includes vacuum and non-vacuum meat packaging systems that address the need to reduce spoilage and petro-plastics use, waste valorization, while also enhancing product safety. These objectives are in line with SRIA Thematic area 3, Operational Objective 7, Research priorities 2 and EU Policies.

We propose various biobased approaches, with a focus on:

- bioactive molecules (engineered adhesive antimicrobial proteins, antimicrobial);
- agents from marine bacteria and/or actinomycetes, phenols from wastes);
- biopolymers (Polyhydroxyalkanoates (PHAs), cellulose);
- functional coating;
- design, techno-economical evaluation of new packaging concepts

Expected impacts and results

- Validation of effective antimicrobial agents through storage tests with meat products;
- establishment of bioprocesses for various PHAs;
- implementation of a cascade approach for waste valorization;



Other in Consortium/ 8

AlterEco Pulp Srl (AEP) - IT

FOSAN E.T.S, Ente di Ricerca per lo Studio degli Alimenti e della Nutrizione (FOSAN) - IT

Ankara University (AU) - TR;

GTE Sustainability and Energy Consultancy (GTE) - TR

Université Abderrahmane Mira – Béjaïa (UAMB) - DZ

C.I.P. Citizens in Power (CIP) - CY

Fraunhofer Institute for Process Engineering and Packaging IVV (IVV) - DE

Universitat Jaume I (UJI) - ES

- techno-economic validation of innovative active vacuum and non-vacuum packaging;

- scientific cooperation on a transnational level;

- increased social awareness about food losses and impact of fossil-based plastics.

The expected results will achieve TRLs 5. MATE4MEAT will introduce novel environmentally friendly techniques to mitigate food waste, demonstrate the efficacy of bio-based materials for active packaging, decrease reliance on chemical treatments while preserving nutritional and sensory qualities of food, and foster the development of local sustainability-oriented bio-based value chains

Keywords

#Polyhydroxyalkanoates

#fungal_self-assembling_proteins

#life_cycle_assessment

#life_cycle_assessment

#composite_materials

#surface_coating

#antimicrobials

#biodegradability

#safety_assessment



Thematic Area

Agri-food Value Chain



Action and Topic

RIA - Research and Innovation Action



Budget

999.768,00 €



Duration

36 months



State and Coordinator Entity

PORTUGAL

Centro de Biotecnologia e Química Fina (CBQF) - Universidade Católica Portuguesa



UNIVERSIDADE
CATOLICA
PORTUGUESA

Scientific Coordinator:

EL-DEEB, Nehal

Participating States/ 4



Research Units/ 8



Section 2

NOVAPACK

NOVeL Antimicrobial coatings and PACKaging in the mediterranean

Context

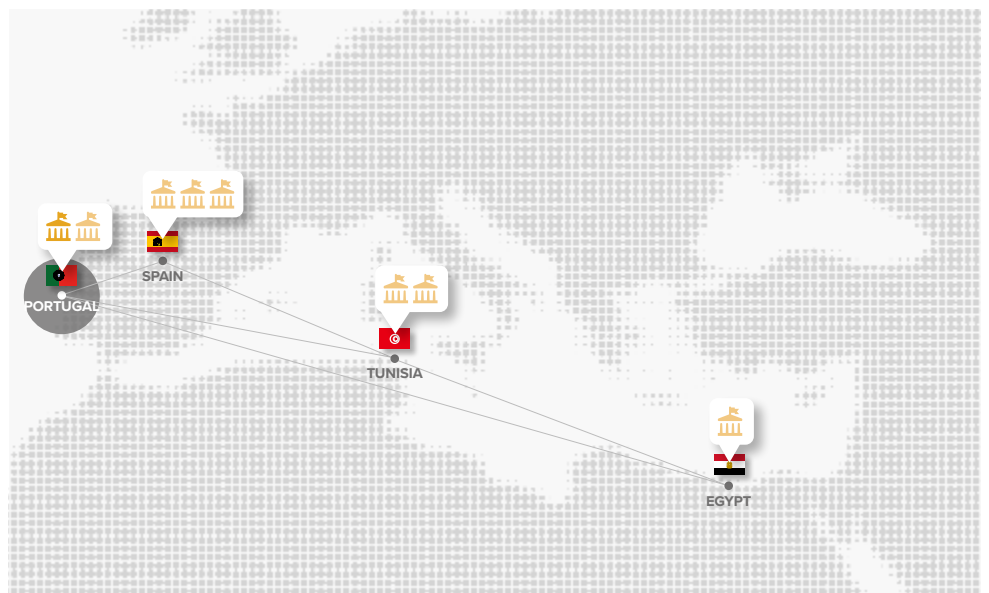
The main goal of the NOVAPACK project is the development of novel and costcompetitive antimicrobial coatings, films and bio-based packaging based on bio-based and biodegradable products, to reduce food waste and plastic, while improving Mediterranean food products' shelf-life and safety.

Objective and contents

Specifically, NOVAPACK will develop different extracts ranges (e.g., bioactive compounds, soluble polysaccharides, and lignocellulosic materials) through the application of integrative upcycling strategies of F&V losses and by-products, produced at the food supply chain.

The extracts with antimicrobial and antifungal activities and antioxidant properties will be used in the development of active food coatings and films, and naturalcoloured extracts and pH indicators will functionalize the biodegradable packaging.

To develop newly designed food products with enhanced shelf-life, quality and health-related beneficial properties, the bioactive coatings will be applied to the most perishable foods (e.g., strawberries, blueberries, red berries and tomatoes) increasing their resilience to contamination, increasing water retention capacity and increasing food shelf-life.



Other in Consortium/ 7

Molecule Message Unipessoal Lda (AgroGrIN Tech) - PT

EVERSIA S.A. - ES

National Technological Centre for the Food and Canning Industry - ES

Technological institute of Plastic - ES

ISBA Medenine Gabed university - TN

Zina Fresh Company Gabes - TN

National Research Centre - EG

Expected impacts and results

The biodegradable films and packaging combined with bioactive extracts will be applied to perishable animal products (e.g., sliced cheese and ham) synergistically acting in the reduction of food losses, food spoilage and the use of plastic, leading to better consumer safety features aligned with relevant standards.

The objectives of NOVAPACK will be achieved since the consortium gathers a diversified group of leaders that ensures the know-how, engages with key stakeholders (public and private actors) and promotes its participatory action and fully addresses the PRIMA Topic 2.3.1- 2023 (RIA) Assessing novel antimicrobial food packaging and coating materials (Section 2).



Thematic Area

Agri-food Value Chain



Action and Topic

RIA - Research and Innovation Action



Budget

1.620.00,00 €



Duration

36 months



State and Coordinator Entity

GREECE

Ellinikos Georgikos Organismos - Dimitra



Scientific Coordinator:
MARKOU, Giorgos

Participating States/ 7



Research Units/ 9



Section 2

NOVISHPAK

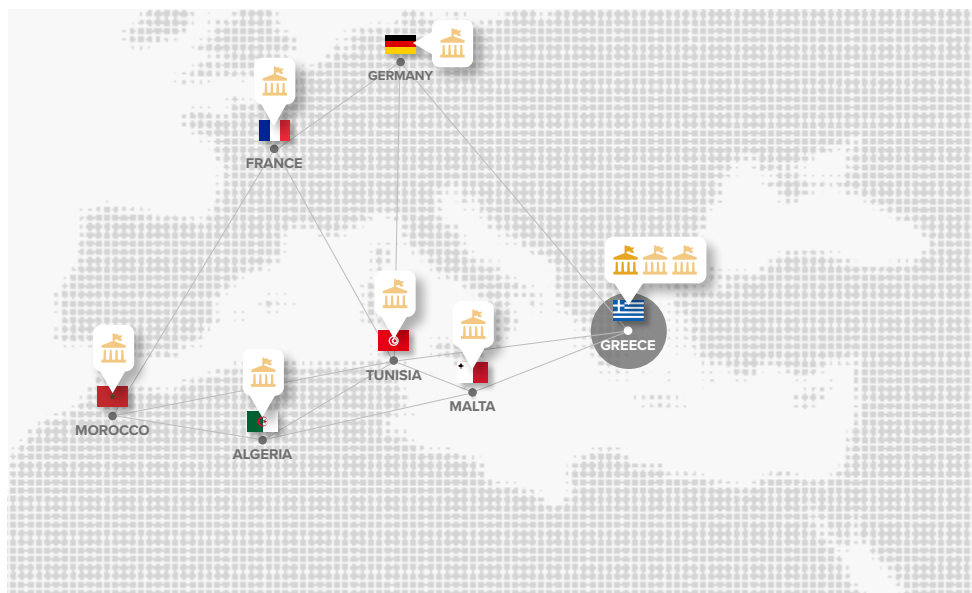
Novel biodegradable, antimicrobial and smart packaging and coatings for increased shelf-life of Mediterranean fish filets

Context

The consumption of chilled and frozen fish products is remarkably growing whereas food safety and control are of great concern for the whole consumers community. The efficiency of packaging solutions (films and coatings as well as smart packaging tools) of perishable fresh fish products to increase their shelf-life and reduce food waste is of high priority for all stakeholders involved in food manufacturing, trade, logistics and distribution. Seaweeds are a potentially important source of compounds to develop innovative packaging materials. Growing seaweed could help to boost the blue-bioeconomy sector and provide coastal communities with a long-term source of income.

Objective and contents

The main objective of the project is to develop innovative biodegradable, antimicrobial and smart packaging films and edible coatings based on brown seaweed polysaccharides used for the extension of shelf-life of Mediterranean fish fillets. A novel post-harvest bioprocesses will be used to enhance the content and physicochemical characteristics of the algal polysaccharides. The materials will be, then, enhanced with natural parabolic compounds originating from probiotic microorganisms as well as various antimicrobial agents from fish fillet production waste. The materials will also be incorporated with scavengers and colour-changing dyes that respond to ammonia and pH levels to provide an extra layer of monitoring fish quality and evaluate the chill chain. Further, cutting-edge technologies such as cold atmospheric plasma (CAP) will be employed to enhance material's surface characteristics, mechanical, and thermal properties. The developed novel packaging solutions will be used in Mediterranean fish fillets shelf-life extension that is an extremely perishable product with a lot of loss and waste. The applicability and efficiency of the new film and coating materials along with the use of innovative smart packaging tools that includes ICT, will be tested in real chill chain scenarios by applying field tests.



Other in Consortium/ 8

GRECA PESCA - GR

NKUA - GR

ESSAIA - DZ

International Centre for Advanced
Mediterranean Agronomic Studies
- Montpellier - FR

Leibniz Institute for Agricultural
Engineering & Bioeconomy - DE

University of Malta - MT

University Mohamed Premier-
Oujda - MA

Université de Tunis El Manar - TN

Expected impacts and results

The ambition of NOVISHPAK is to substantially contribute to the packaging sector by developing novel and sustainable packaging materials that address the limitations of conventional plastics and reduce food waste in the Mediterranean food supply chain. The expected impact of NOVISHPAK will be:

- To demonstrate the efficacy of bio-based materials for packaging to extend the shelf-life and to improve food safety of Mediterranean fish fillets.
- To empower blue-bioeconomy by applying marine feedstock and ingredients (seaweed and fish waste extracts) for the production of packaging materials.
- To introduce new environmentally friendly techniques to reduce food waste

Keywords

#blue-bioeconomy

#biodegradable_materials

#food_safety

#extended_shelf-life

#antimicrobial_and_smart_packaging

#seaweed



New products and solutions:

- ✓ Solutions for three important Med fish fillets (sea bream, sea bass, stone bass);
- ✓ extendable to other agro-industrial products;
- ✓ two antimicrobial packaging films (MAP, Vacuum packaging);
- ✓ two edible antimicrobial coatings (antimicrobial incorporated, antioxidants incorporated);
- ✓ smart packaging solutions (O₂-CO₂, pH indicator)



Thematic Area

Agri-food Value Chain



Action and Topic

RIA - Research and Innovation Action



Budget

504.492,00 €



Duration

36 months



State and Coordinator Entity

TURKEY

Sabancı University
Nanotechnology Research and
Application Center



Scientific Coordinator:
UNAL, Hayriye

Participating States/ 4



Research Units/ 6



Section 2

OLIVEPACK

Bio-based antimicrobial packaging materials to increase the shelf life of naturally fermented low-salt table olives

Context

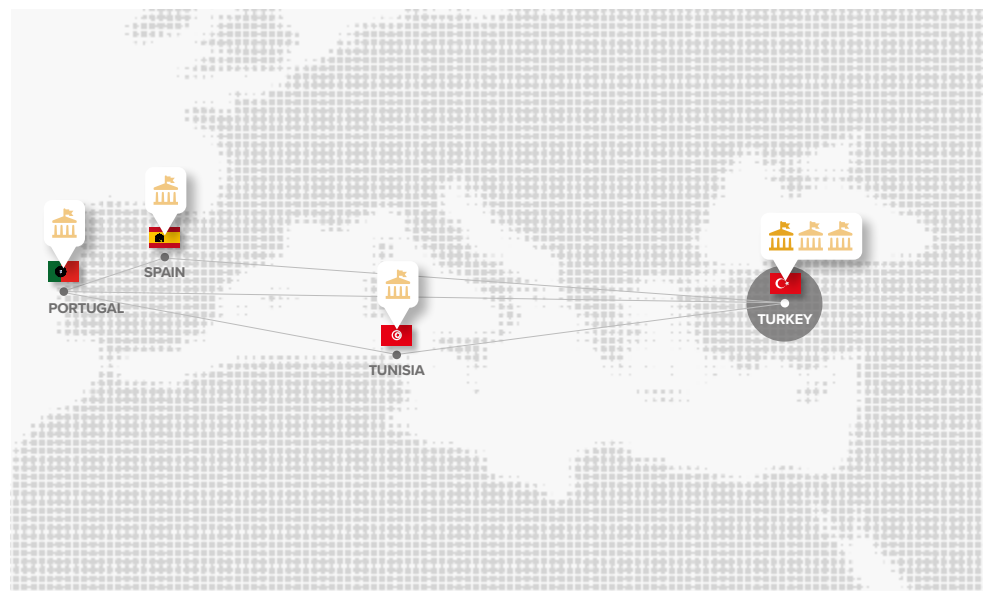
Table olives, native food products of the Mediterranean region with superior nutritional value, are of utmost economic importance due to not only their abundant consumption in the region, but also due to their export to the rest of the world in large quantities. A suitable shelf life for naturally fermented table olives is ensured either by high sodium concentrations during storage or the use of preservatives, both of which not only threaten human health, but also put the economic value of table olives at risk by diminishing their natural origin. OLIVEPACK aims at providing an innovative, circular economy-oriented antimicrobial food packaging solution that will greatly contribute to the quality and safety, as well as to the economic value of table olives in the Mediterranean region.

Objective and contents

The overall objective of OLIVEPACK is to advance an antimicrobial packaging solution for naturally fermented table olives, that will increase their shelf life and allow them to be stored at low sodium content and without preservatives, thus enhancing their quality and safety. Within the scope of OLIVEPACK, a biobased, biodegradable, antimicrobial bionanocomposite foam composed of natural components, that is designed to be placed into any table olive packaging as a packaging insert will be developed. Adapting a circular economy approach, the packaging inserts will be composed of natural antimicrobial agents extracted from table olive wastewater and polymer matrix extracted from olive tree waste. Through a multidisciplinary approach integrating expertise in materials science, food microbiology, sensory analysis and food science, the food packaging inserts will be evaluated in terms of their antimicrobial activity, their effect on the nutritional, physicochemical and sensory properties of table olives, and also their market acceptance and socioeconomic impact.

Expected impacts and results

OLIVEPACK, through an interlinked, interdisciplinary, multi-actor approach, will make significant progress beyond the current state of the art by introducing a novel stor-



Other in Consortium/ 5

Bornova Olive Research Institute (ORI) - TR

Olive Oil Academy (OOA) - TR

Instituto Politécnico de Bragança (IPB) - PT

University of Extremadura (UEX) - ES

University of Sfax (USFAX) - TN

age solution for low-sodium, preservative-free naturally fermented table olives. The novel bionanocomposite foam packaging inserts solely composed of natural and biodegradable components will not only help to reduce food waste but also ensure consumption of safer and healthier table olives with extended shelf-life, all without putting any burden on the environment. The project will conceptualize a systematic evaluation of a bio-based food packaging material both in terms of its technical activity and its position and potential in the market. With the successful completion of the OLIVEPACK project a new bio-based packaging approach that presents substantial advantages over traditional table olive storage solutions will be provided.

Keywords

#active_food_packaging

#antimicrobial_food_packaging

#bio-based_foam

#bionanocomposite

#sustained_release

#table_olive



New products and solutions:

- ✓ Antimicrobial foam-type packaging insert



Thematic Area

Agri-food Value Chain



Action and Topic

RIA - Research and Innovation Action



Budget

993.881,00 €



Duration

36 months



State and Coordinator Entity

PORTUGAL

University of Madeira (UMa)



Scientific Coordinator:
José CÂMARA

Participating States/ 9



Research Units/ 16



Section 2

PASPACK 4.0

Producing Alternative Sustainable food bio-based PACKaging from Mediterranean agri-food by-products and waste

Context

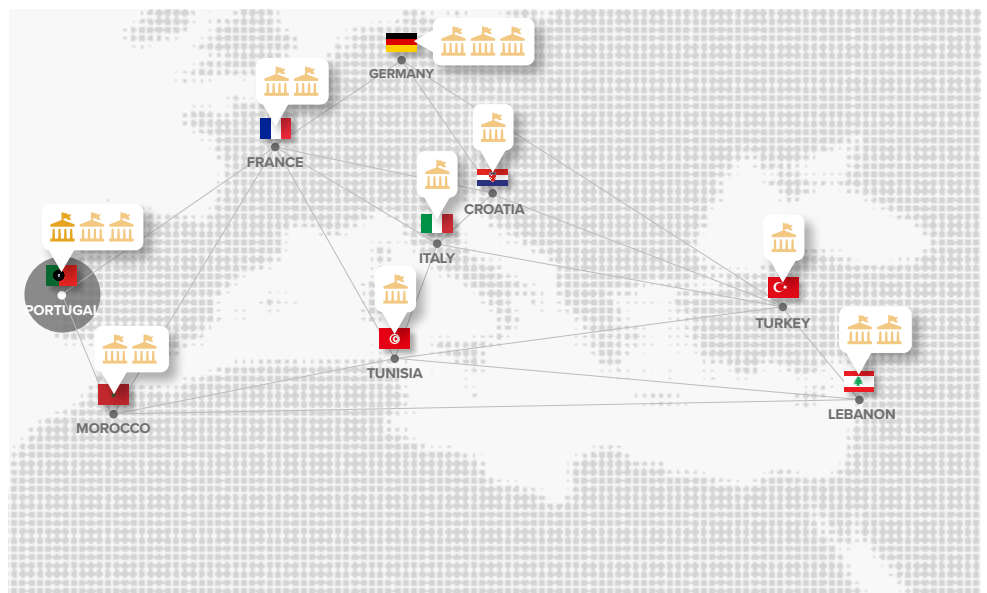
The overall concept of the PASPACK 4.0 project is based on 3 points: i) Valorisation of agricultural raw materials, especially waste and by-products obtained from pomegranates (peel and seeds) and date (cull and pits) in the development of new packaging solutions; ii) Harnessing Industry 4.0 technologies for the production of smart (active and intelligent) bio-based films that can be used for food packaging as alternatives for plastic material; iii) Demonstration of the efficiency of the developed packaging films in improving the shelf-life and ensuring food safety of highly-perishable Mediterranean food products.

Objective and contents

The main objective of PASPACK 4.0 is to provide alternative solutions for two major challenges: overuse of plastics and increasing amount of food waste. The project aim will be achieved by harnessing innovative technologies, especially those of fourth industrial revolution innovation, such as nanotechnology, artificial intelligence, big data, blockchain, 3D printing, and smart sensors including radio-frequency identification (RFID), to develop alternative smart food packaging able to reduce food waste and plastic food packaging material; to be active to maintain food quality and improve shelf-life; to be sustainable, cost-effective, and reduce carbon footprint, as the developed film will be obtained from agri-food by-products and waste, using emerging green extraction and processing technologies; to be flexible and tailored to be applied to different food categories; and to be intelligent to monitor food quality and safety and tell the consumer about the freshness of the packaged food.

Expected impacts and results

PASPACK 4.0 adopts an ambitious approach through various actors across the Mediterranean region that will promote innovation and underpin revolutionary change in the field of food science and technology, providing a positive impact on the society, economy, and environment, by i) ntroducing new environmentally friendly techniques



Other in Consortium/ 15

Centro de Apoio Tecnológico Agro-Alimentar (CATAA) - PT

Logoplaste (LogoP) - PT

Centre for Innovative Process Engineering (CENTIV) - DE

Leibniz University Hannover (LUH) - DE

Traceless materials GmbH (TraM) - DE

VetAgro Sup (VetAgro Sup) - FR

Sustainable AgriFoodtech Innovation & Research (SAFIR) - FR

University of Balamand (UOB) - LB

Lebanese University (LU) - LB

Mohammed V University of Rabat (MVUR) - MA

Centre Technique de Plasturgie et de Caoutchouc (CTPC) - MA

University of Zagreb (UNIZG) - HR

University of Naples Federico II (UNINA) - IT

University of Cukurova (CUNI) - TR

National Institute of Research and Physicochemical Analysis (INRAP) - TN

to reduce food waste; ii) demonstrating the efficacy of bio-based materials for packaging to improve food safety and reduce food waste that meets market requirements; iii) Reduce the need for chemical treatments by using agricultural by-products and control pathogenic bacteria while preserving food's nutritive and organoleptic properties; iv) Job creation and job retention activities with equal gender opportunities.

Keywords

#bio-based_smart_food_PACKaging

#sustainability

#valorization_of_agrifood_waste

#circular_bioeconomy



Demo sites/case studies



Platforms / Hub



New products and solutions:

- ✓ new products;
- ✓ smart packaging for animal origin foods;
- ✓ smart packaging for plant-based origin foods



Thematic Area

Agri-food Value Chain



Action and Topic

RIA - Research and Innovation Action



Budget

2.019.816,00 €



Duration

36 months



State and Coordinator Entity

ITALY

University of Pisa (UNIPi)
Department of Civil and Industrial engineering



UNIVERSITÀ DI PISA



Scientific Coordinator:
MAALEJ, Hana

Participating States/ 7



Research Units/ 10



Section 2

PLAMINPACK

PLAnt-based antiMicrobial aNd circular PACKaging for plant products

Context

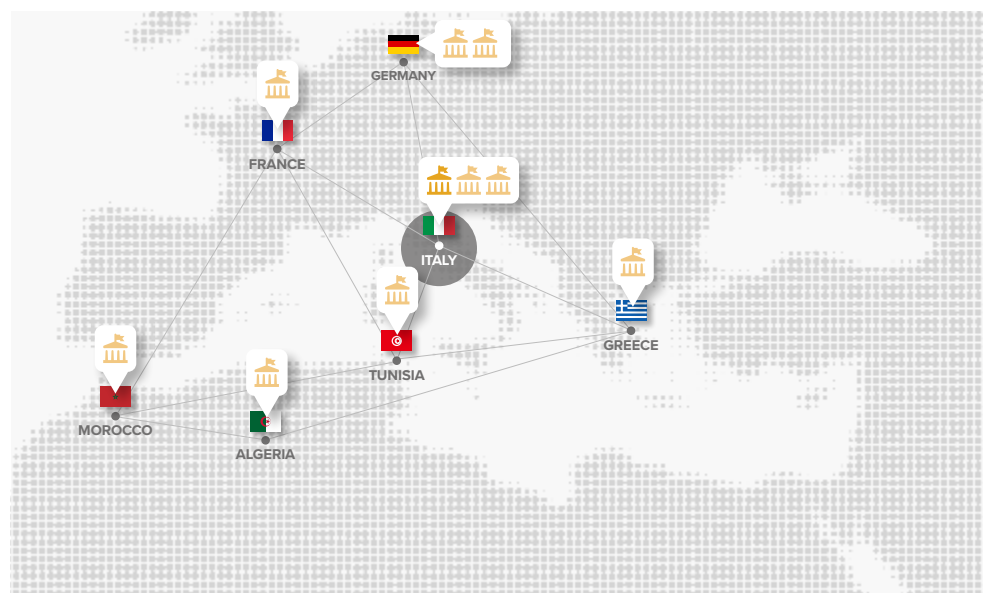
On a global scale, including the Mediterranean area, a substantial amount (25–50%) of fruits and vegetables is lost from farm to fork. Nevertheless, promising anti-microbial biobased materials are today available for perishable foods sustainable packaging, to increase their shelf life safeguarding the environment. Moreover, farms need to increase their incomes valorising their agro-waste to fuel new bioeconomy industrial chains, necessary to contrast climate change and pollution, additionally promoting a responsible and healthy way of living.

Objective and contents

The objective of PLAMINPACK is the development of anti-microbial packaging materials for perishable food based on biopolymers and molecules from plant origin. Three representative perishable Mediterranean fruits were selected for testing the different packaging: tangerine for net, dates and strawberry for film and tray. The anti-microbial and anti-oxidant molecules will be extracted from the plants waste. Anti-microbial chitosan will be obtained by bioconversion of plants waste through rearing *Hermetia Illucens* insects. The packaging will be tested in terms of anti-microbial properties and shelf-life tests. Plasma treatments and liquid treatments applied on fruits will be considered to improve the shelf-life avoiding the loss of food. With this aim two interesting potential tools will be developed: a database to connect plant waste with quality and amount of extracts; digital twin applied to fruit ripening and packaging, in view of developing a predictive machine learning instrument. Life Cycle Assessment will be carried out for the new packaging. The behaviour of the packaging in the end of life will be considered as well.

Expected impacts and results

The expected results of PLAMINPACK project are: (1) developing easy to up-scale biobased packaging materials and methodologies (to produce nets, films, trays, coatings) based on plant waste sources for reducing the loss of perishable food (in par-



Other in Consortium/ 9

Next Technology Tecnotessile - IT

Università degli Studi della Basilicata - IT

Albstadt-Sigmaringen University - DE

Universität Hohenheim - DE

University Abdelhamid Ibn Badis of Mostaganem - DZ

AgroParisTech - FR

University of Ioannina - GR

Università Cadi Ayyad - MA

Sfax University - TN

ticular tangerine, strawberry and dates). (2) inserting this new packaging in the circular management of a farm, including specific digital tools, so that all the biomass waste is reused and contribute to generate again food, packaging, feed or amendments. Moreover, the new packaging materials will be tested for their stability under environmental conditions exposure as well as potential recyclability and environmental impacts after waste materials disposal. (3) contributing to local businesses growth and to job creation so that all actors along the value chains can gain from biomass valorisation, protecting biodiversity and the environment while securing food products.

Keywords

#anti-microbial #packaging #circular #biorefinery #biobased
#compostable #fruits #plants #waste #net #tray
#film #plasma #coating #bionanocomposite #composite
#shelf-life #digital #LCA #ecotoxicology



New products and solutions:

- ✓ circular anti-microbial packaging solution for tangerine based on biobased nets;
- ✓ circular anti-microbial packaging solution for strawberry and dates consisting of biobased film and tray



Thematic Area

Agri-food Value Chain



Action and Topic

RIA - Research and Innovation Action



Budget

2.075.283,00 €



Duration

36 months



State and Coordinator Entity

GERMANY

University of Hohenheim



Scientific Coordinator:
SCHMÖCKEL, Sandra

Participating States/ 9



Research Units/ 13



Section 2

QuiPack

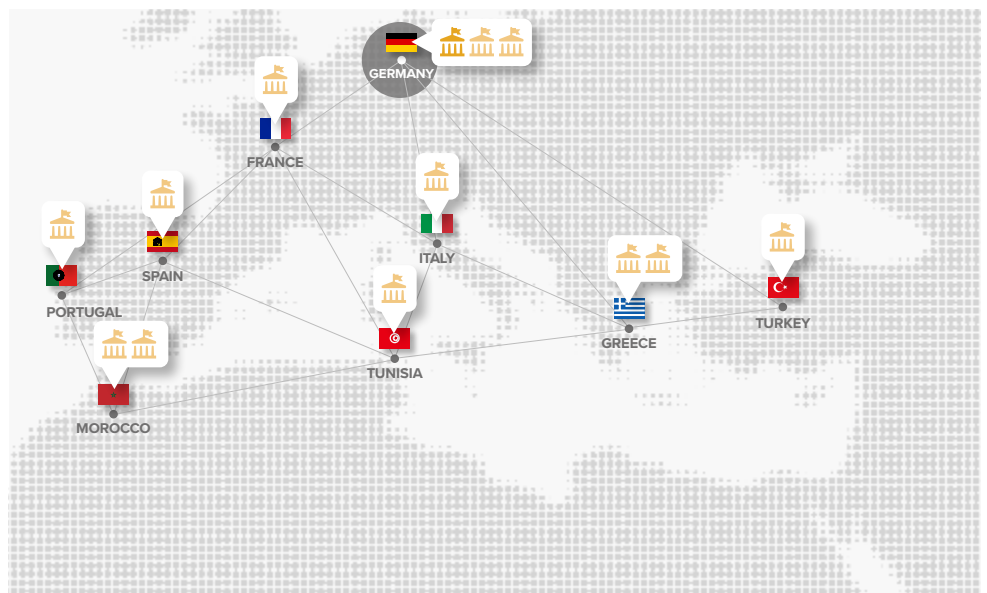
Food value chain intelligence and integrative design for the development and implementation of innovative food packaging according to bioeconomic sustainability criteria

Context

According to FAO, approximately 14% of global food production is lost, and 17% is wasted, leading to environmental impacts, food security challenges, and higher costs. The Mediterranean region, with its diverse cuisines, is particularly sensitive to this issue. Bacterial and fungal pathogens in contaminated food pose major health risks and reduce shelf life. Packaging plays a crucial role in preserving food by protecting it from contamination. Innovations like active smart packaging extend shelf life and monitor food quality in real-time. There is growing concern over the environmental impact of packaging, leading to efforts for more sustainable solutions, such as those derived from agricultural and marine waste. Natural compounds are increasingly used to replace synthetic materials in packaging, creating bio-based, biodegradable options that can monitor food quality. These solutions, combined with blockchain and IoT, are vital for ensuring food safety along the supply chain. QuiPack's initiatives, aligned with international and regional strategies, aim to enhance food safety, quality, and sustainability in the Mediterranean.

Objective and contents

The multidisciplinary QuiPack consortium and its associated partners are determined and will mobilize all necessary resources to become a pioneer and pacemaker for the technological advancement of biodegradable, antimicrobial packaging materials in the Mediterranean region, while integrating environmental, economic and social sustainability in the food sector. By valorizing food production side/waste streams, we will pave ways for a bright future and competitiveness of Mediterranean rural areas. Our food value chain intelligence and AI/IoT-assisted decision support for a comprehensive food safety management together with the envisaged environmentally friendly packaging innovations shall revolutionize the food sector and reduce its environmental footprint. By providing sustainable, highly functional and flexible solutions that protect and preserve a wide range of foods, QuiPack aims to limit food losses by 50% (through enhanced shelf-life and more effective monitoring-based logistics), to



Other in Consortium/ 12

Fibers365 GmbH - DE

Institut für Naturstoffverarbeitung
INV - HdM Forschungscampus
Lenningen - DE

AgriTrack SA - GR

University of Thessaly - GR

Moroccan Foundation for
Advanced Science, Innovation and
research - MA

University Cadi Ayyad - MA

Ecole Nationale Vétérinaire,
Agroalimentaire et de
l'Alimentation Nantes Atlantique
- FR

Ca' Foscari University of Venice -
IT

Universidade de Aveiro - PT

University of Vic-Central University
of catalonia - ES

Centre of Biotechnology of Borj
Cedria - TN

Atatürk Üniversitesi, Fisheries
Faculty - TR

Demo sites/case studies

4 

Platforms / Hub

1 

New products and
solutions:
✓ novel functional
Packaging
solutions

increase food safety (through novel formulations of nature-based antimicrobials), and to achieve 100% bio-based smart packaging by 2035. The project's packaging and traceability concept is envisioned to also improve consumer trust in quality labels and reduce food fraud by at least 75% with smart, chitosan-based RFID tags within the next 10 years. To achieve these ambitious goals, the consortium will engage with and involve all actors and stakeholders along the food value chain, especially producers, regulatory authorities, consumers, and thematic networks. By building bridges from QuiPack's use-inspired research to science-informed practice, we will converge synergies throughout the Mediterranean, strengthening sustainable transformation of the food packaging sector in particular, and the collective movement for sustainable transformation in general. Moreover, we envisage our bio-packaging solutions to be transferred and adapted to the full range of packaging needs in the food sector, but also for pharma and other goods that require antimicrobial treatment. QuiPack will reinforce capacity building by joining forces with the EU Packaging Institutes Consortium and Arab Food Safety Initiative with regard to life-long learning, training, research, and consulting services related to sustainable packaging. All project results will be communicated FAIR and with open access, as long as IPR and commercial interests of business partners are secured. We will promote the secondary use of data as valuable resources for researchers, companies, and policymakers to stay informed and build upon the latest knowledge and best practices in sustainable and smart food packaging technology.

Expected impacts and results

Mediterranean countries are important trading partners because of their close geographic proximity. Overall, the value of food trade between Europe and the Maghreb countries has been increasing in recent years. In 2019, the total value of food imports from the Maghreb countries to the European Union already has reached 6.5 billion €, with Morocco being the largest exporter, followed by Tunisia and Algeria. QuiPack will deliver an integrated approach, novel opportunities and solutions for actors along the entire food chain leading to reduced food waste, preserved natural resources, improved food safety and authenticity of produce, and transforming the Mediterranean food sector towards more sustainability. QuiPack will engage and extend its multifaceted networks to share scientific and technical knowledge between research, business management, industry, authorities, policy and consumers promoting the exchange of best practices and improving trust and confidence in novel antimicrobial and smart packaging for agri-food products.

Keywords

#versatile_microbiome-based

#biointelligent_packaging_solutions

#chitosan-based_RFID_sensors

#biobased_packaging_value_chains

#IoT/AI-assisted_supply_chain_tracking

#safety/allergenicity_tests

#antimicrobial_compounds

#agri-aquacultural_waste/side_streams

#multi-stakeholder_Life_Cycle_Design_Approach

#business_roadmap



Thematic Area

Agri-food Value Chain



Action and Topic

RIA - Research and Innovation Action



Budget

978.280,00 €



Duration

36 months



State and Coordinator Entity

ITALY

University of Perugia



A.D. 1308

unipg

UNIVERSITÀ DEGLI STUDI
DI PERUGIA

Scientific Coordinator:
DE FRANCESCO, Giovanni

Participating States/ 5



Research Units/ 9



Section 2

SAFOOD4MED

Innovative and safe antimicrobial bioplastics for food preservation in the Mediterranean area

Context

The increasing food loss and waste brings environmental challenges and growing disposal costs, especially for Mediterranean countries due to limited water resources and rising temperatures. The food packaging industry faces challenges in both global competitiveness and meeting local nutrition demands. Adequate packaging methods contribute to reduce food loss and waste, improving food

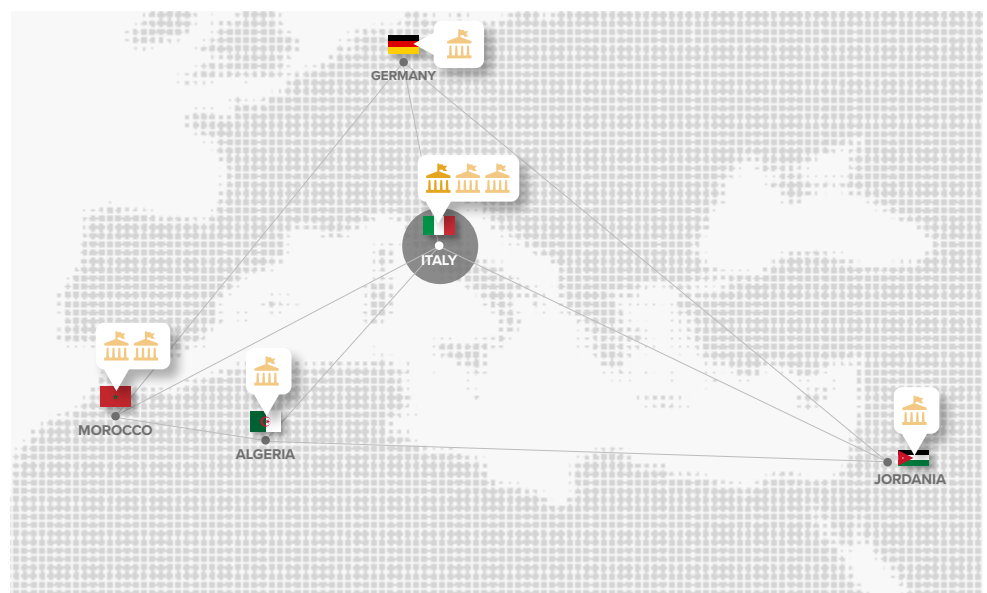
Objective and contents

By efficiently repurposing food waste as renewable resources, we can leverage their components to create new biopolymers tailored for use in bioplastic food packaging applications. The goal is to achieve the efficient separation of food-waste lignocellulose constituents with a purity level suitable for the identified application. A set of multifunctional barrier films with peculiar antimicrobial characteristics will be developed, suitable for food contact applications. The realization of this objective will significantly contribute to enhancing food security, prolonging the shelf-life of select food products in contact with these films, and reducing the transmission of diseases through food packaging. A decentralized small-scale biorefinery system to valorise food waste will be set. This system allows for the immediate local reuse of food waste, such as water, minerals, residual organic matter and sand, prior to transportation to a central biorefinery for further processing.

Expected impacts and results

Major expected results will be:

Introduce new sustainable, resource efficient techniques to reduce food waste; reduce the chemical treatments by using agricultural by-products; Longer shelf life for food products can translate into better access to nutritious food, potentially improving public health outcomes by reducing malnutrition and foodborne illnesses; providing tools and increasing farmers knowledge to manage their waste and post-harvest



Other in Consortium/ 8

Universitas Mercatorum (UNIM) - IT

Sapienza University of Rome (UNIROMA1) - IT

University of Ibn Tofail UIT - MA

Technical Center of Plastics and Rubber CTPC - MA

University of Biskra UMKB - DZ

Agricultural Research Centre ARC - EG

WAZIUP Open Source IoT and Cloud platform - DE

Al Balqa Applied University - JO

losses, which enhance their profit margin.

Major impacts will be:

Ensure incomes to smallholders; empowering the small farmers, placing them in a better position within the value chain; integration of part of biorefinery into the farms, leading to redistribution of income in the chain through local or decentralized food waste processing.

Keywords

#biorefinery

#food_packaging

#bioplastics

#food_waste

#sustainability

#antimicrobial



Platforms / Hub



Thematic Area

Agri-food Value Chain



Action and Topic

RIA - Research and Innovation Action



Budget

827.691,00 €



Duration

36 months



State and Coordinator Entity

ITALY

University Niccolò Cusano



Scientific Coordinator:
CACCIOTTI, Ilaria

Participating States/ 6



Research Units/ 8



Section 2

SAPHIRA

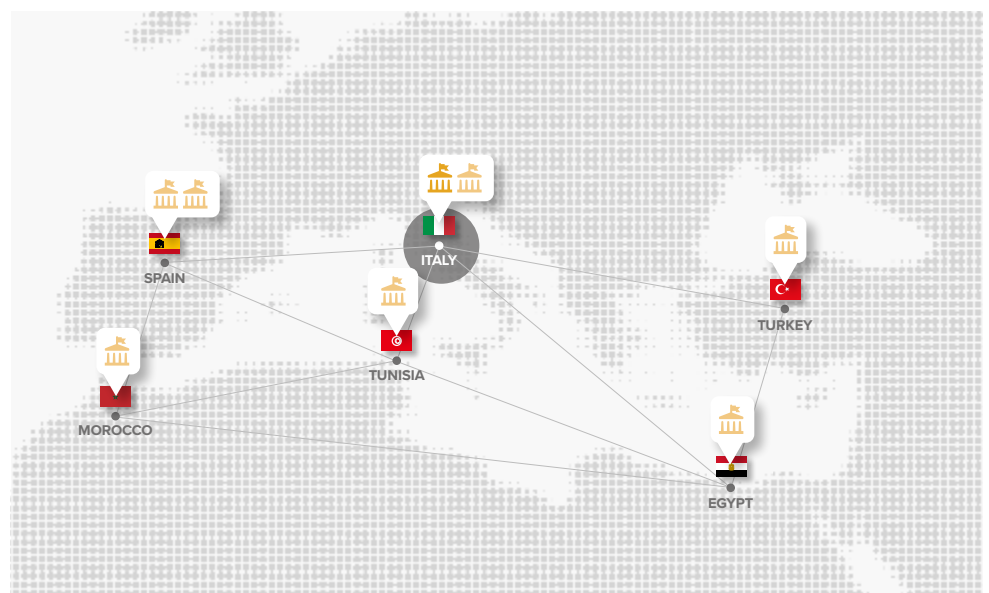
Sustainable Antimicrobial Packaging based on a Healthy Intelligent Renewable Approach

Context

Globally, around 14% of the produced food is lost between harvest and retail. Significant quantities are also wasted at the retail and consumption levels. Overall, an estimated 17% of total global food production is wasted (11% in households, 5% in the food service and 2% in retail). Particularly, fruits and vegetables account for 45-50% of lost or wasted food. Smart active packaging and functionalized edible coatings are considered promising strategies to reduce fruit and vegetables post-harvest losses by preserving freshness and quality standards, and prolonging their shelf life.

Objective and contents

SAPHIRA general objective is to improve the processing and storage of fruit products through the design and validation of eco-sustainable, antimicrobial and smart packaging systems, with the support of ICT technologies. SAPHIRA simultaneously replies to two relevant social and health concerns, i.e. the urgent need for new efficient food packaging solutions in order to increase food shelf life and safety, and the emergency for a sustainable waste management, in agreement with the “zero waste standard” and the Circular Economy strategies. SAPHIRA systems will be based on bio-based compostable polymers and agri-food waste-derived extracts and fillers to provide antimicrobial and antioxidant properties and mechanical reinforcement, respectively. Thus, SAPHIRA strategy will allow reducing food losses and waste, not only improving the shelf life and durability of the packed food but also finding a new life for waste products. Additionally, the food safety and quality will be monitored, supplying food packaging with innovative biosensors for the detection of pathogens in order to further reduce food losses and wastes.



Other in Consortium/ 7

Consiglio per la ricerca
in agricoltura e l'analisi
dell'economia agraria- Research
Centre for Olive, Fruit and Citrus
Crops (CREA OFA) - IT

Universidad de Granada
(UGR), Facultad de Ciencias
- Departamento de Química
Analítica - ES

Universidad de Alicante - ES

National Research Centre (NRC) -
EG

University of Cadi Ayyad (CAU) -
MA

Laboratoire de recherche en
Informatique, Modélisation et
Traitement de l'Information et de la
Connaissance (LIMTIC), Université
de Tunis El Manar, Institut
Supérieur d'Informatique - TN
MetaMeta Anatolia (MMA) - TR

Expected impacts and results

SAPHIRA activities will develop high-performance sustainable materials for intelligent food packaging to replace traditional ones with high environmental impacts, in line with the European Green Deal objectives and the EU 2050 targets. Through an interdisciplinary approach, it is expected to make measurable contributions

Keywords

#smart_food_packaging

#antimicrobial_food_packaging

#agrifood_waste

#natural_extracts

#monitoring

#biosensors

#optical_sensors

#Life_Cycle_Assessment_LCA

#circular_economy

#increased_shelf-life

New products and solutions:

- ✓ multifunctional active packaging;
- ✓ electrochemical (bio) sensors;
- ✓ oxygen optical sensors;
- ✓ optical (bio) sensors;
- ✓ IoT and sensor networks (Internet of Food);
- ✓ big data analytics in food industry



Thematic Area

Agri-food Value Chain



Action and Topic

RIA - Research and Innovation Action



Budget

1.052.584,00 €



Duration

36 months



State and Coordinator Entity

SPAIN

University of Oviedo



Universidad de Oviedo

Scientific Coordinator:
RENDUELES, Manuel

Participating States/ 6



Research Units/ 12



Section 2

SuN4Med

Sustainable and Novel Food Packaging based on Agro-industrial By-products and Natural Antimicrobials from the Mediterranean Area

Context

SuN4Med aims to develop a composite material using the combination of modified cellulose extracted from prickly pear peels or hazelnut/almond shells, and modified potato peel starch, or modified pectin from citrus peels or grape pomace. The combination of these biopolymers can improve the overall performance of the packaging material, especially with the addition of hydroxyapatite, which could improve its mechanical and barrier properties and provide antimicrobial features. The proposed solution offers a combination of sustainability, biodegradability, and potential economic benefits that are not commonly found in existing packaging alternatives, making it a potentially innovative and competitive solution in the market.

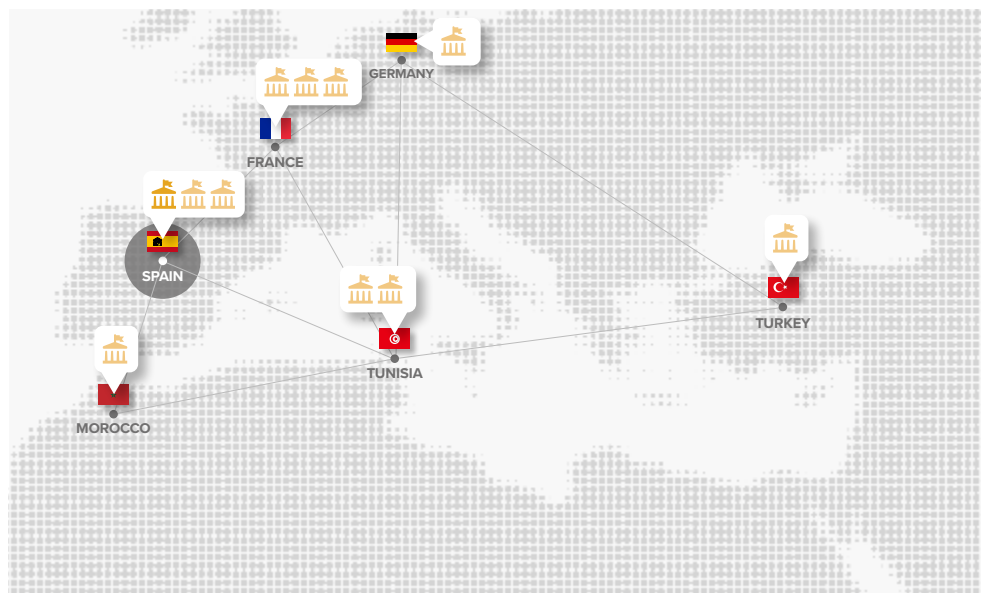
Objective and contents

The AgriBioPack project aims to develop bio-based active packaging solutions for Mediterranean products, enhancing marketability by extending shelf life and reducing food waste. Specific objectives include identifying promising agrifood residues, extracting biopolymers and bioactive compounds, exploring alternative production routes, optimizing packaging formulations, evaluating performance, integrating ICT solutions for data analysis and monitoring, and assessing environmental and cost effectiveness. Through carefully controlling planning and execution, the project seeks to advance sustainable packaging solutions and valorize agrifood residues, benefiting Mediterranean communities.

Expected impacts and results

AgriBioPack expected results and impact:

- environmental Impact Reduction: Sustainable packaging from agrifood residues will cut greenhouse gas emissions;
- enhanced Food Safety & Waste Reduction: Novel antimicrobial packaging will boost shelf life, reducing food waste;



Other in Consortium/ 11

Iberfruta Muerza S.A. - ES

Instituto Tecnológico de Castilla y León, ICTL - ES

LAGEPP, University of Claude Bernard Lyon 1 - FR

IS2M, CNRS Mulhouse - FR

APTAR CSP Technologies - FR

ENIS, University of Sfax - TN

ISSAT, University of Gabes - TN

Süleyman Demirel University - TR

Teknopak Plastik San. Ve Tic. Ltd. Sti. - TR

University of Wuerzburg - DE

University of Cadi Ayyad - MA

- sustainable Antimicrobial Solutions: Decreased reliance on synthetic additives, lowering the carbon footprint;
- natural Antimicrobial Agents Valorization: Promoting sustainable practices with phenolic compounds and essential oils;
- collaborative Database Development: Mapping feedstock availability, optimizing extraction, fostering sustainable practices;
- microbiome-Based Innovation: Advancing microbiome approaches for prolonged food shelf life, reducing chemical use;
- innovative Product Prototypes: Creating consumer-centered, high-quality food products with extended shelf life, opening new market opportunities.

Keywords

#green_extraction

#microbial_cellulose

#PLA_films

#pea_protein_coatings

#antimicrobial_packaging

#shelf_life



Demo sites/case studies

2

Platforms / Hub

1

New products and solutions:

- ✓ solvent casting (for films and coatings);
- ✓ ompression-molding;
- ✓ extrusion;
- ✓ innovative, eco-friendly packaging methods, reducing CO2 emissions and energy use

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Chiusdino (Siena) - Italy

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Funded Projects 2023



PRIMA Foundation

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Carrer Jordi Girona 29, 2nd floor 2A
08034 Barcelona

<http://prima-med.org>



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