

Under the High Patronage of His Majesty King Mohammed VI



XIX WORLD WATER CONGRESS
International Water Resources Association (IWRA)
Marrakech, Morocco | 1-5 December 2025

Kingdom of Morocco



Ministry of
Equipment and Water

Special Session: Enhancing Water Security Through Non-Conventional Resources: Economic, Technical, and Social Dimensions

Julio Berbel (UCO), Alfonso Expósito (UMA), Yasmina Imani (IAV),
Houda Taimourya (IAV), Rafael Casielles (BIOAZUL), Antonia Lorenzo
(BIOAZUL)

Marrakech, 2nd of December, 2025



Introduction to the session

Water scarcity remains a critical challenge, particularly in arid and semi-arid regions where demand for freshwater is rising. A transition to a circular water economy—integrating water reuse, desalination, and innovative water management practices—is essential for sustaining water availability for agriculture, industry, and public use. However, while technological advancements have improved the feasibility of non-conventional water resources, key challenges remain, including economic viability, scalability, policy frameworks, and social acceptance.

Aligned with the **XIX World Water Congress** theme, “**Water in a Changing World: Innovation and Adaptation**”, this special session explores the **economic, technical, and social** aspects of non-conventional water use. Experts will present state-of-the-art research and case studies focusing on the challenges and opportunities of reclaimed and desalinated water use, particularly for agriculture.



Structure of the session



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Four leading experts will deliver presentations addressing **economic, technical, and policy dimensions** of water reuse and desalination:

Are We Overestimating Reuse Volumes?

Speaker: Julio Berbel (UCO)

Economic Viability of Water-Reclamation Projects: Challenges, Instruments, and Opportunities

Speaker: Alfonso Expósito (UMA)

Combining Water Blending and Innovative Technologies for the Sustainable Use of Desalinated Water in Irrigation

Speaker: Houda Taimourya (UMA)

Challenges of water reuse in Andalusia – Optimizing Fertilization in Agriculture: The Role of Nutrient Management with Reclaimed Water in the BONEX Project and opportunities created by BOOST-IN initiative.

Speaker: Rafael Casielles (BIOAZUL)



Expected impacts and outcomes



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By bridging the gap between **technical innovation, economic feasibility, and policy considerations**, this session will provide **actionable insights** on advancing circular water economy approaches.

Expected outcomes include:

- **Greater awareness** of economic and technological challenges in water reuse and desalination.
- **Identification of best practices** for integrating non-conventional water sources into agricultural and urban systems.
- **Improved stakeholder engagement**, fostering **collaborations** for future projects and policy development.
- **Concrete recommendations** for scaling up non-conventional water use while ensuring environmental and economic sustainability.
- This session will equip participants with the knowledge and tools to **drive the transition to a circular water economy**, making water reuse and desalination integral to global water security strategies.



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Economic Viability of Water-Reclamation Projects: Challenges, Instruments, and Opportunities

Alfonso Expósito
University of Malaga (Spain)
December 2nd, 2025

Setting the stage...



Water Scarcity on the rise

Estimated water availability per capita (m³/capita – 2000-2017)

Count..	2000	2010	2017
Austria	11,298	9,477	8,444
Switzerland	7,728	6,113	4,902
Romania	4,500	8,159	4,956
France	3,933	3,286	2,430
Spain	4,146	2,308	2,042
Italy	2,120	3,060	1,320
Germany	2,438	2,323	1,629

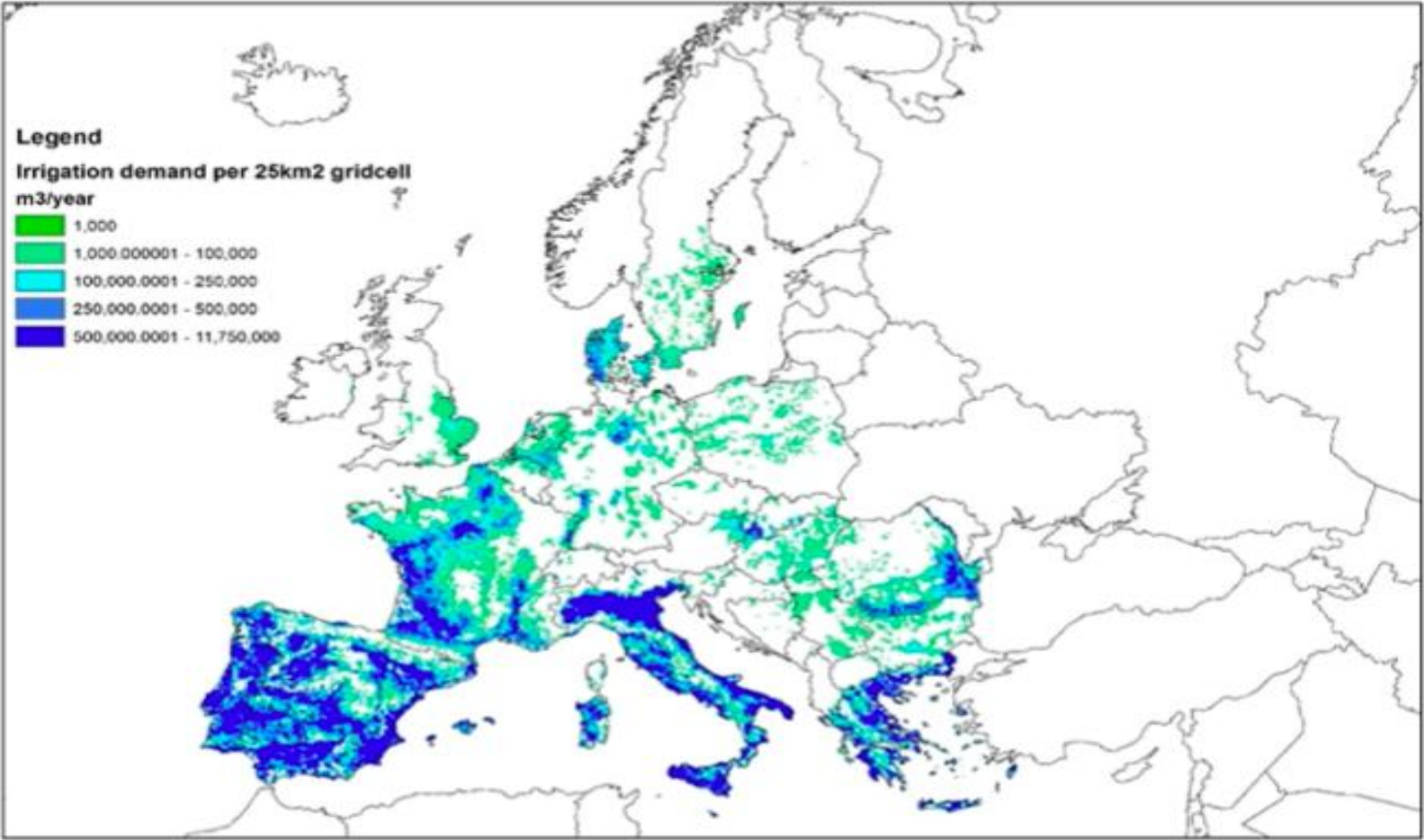
Source: EEA and Eurostat, 2020



Setting the stage...



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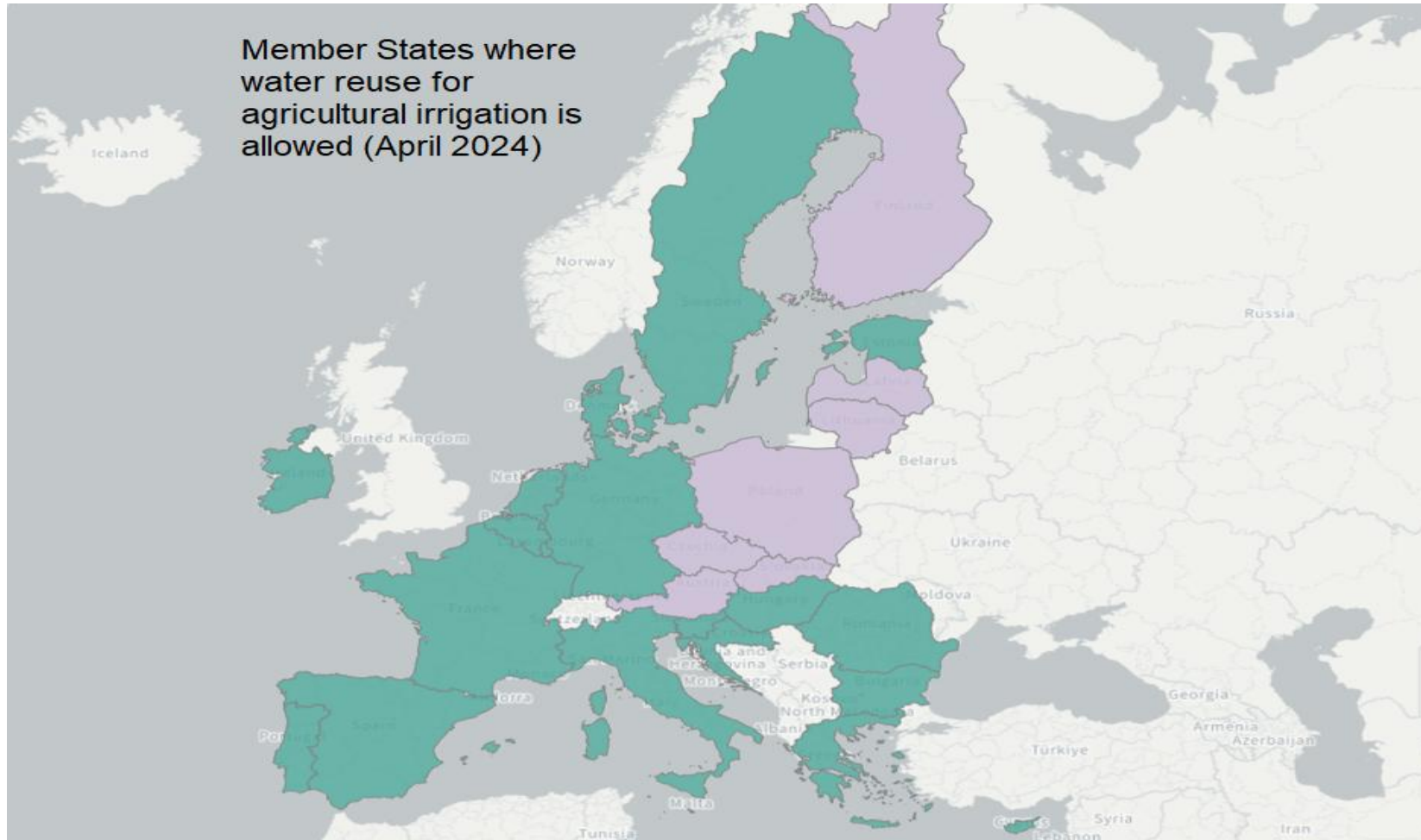
Source: Pistocchi, A., et al. (2018) *The potential of water reuse for agricultural irrigation in the EU. A Hydro-Economic Analysis*, Publications Office of the European Union, Luxembourg.



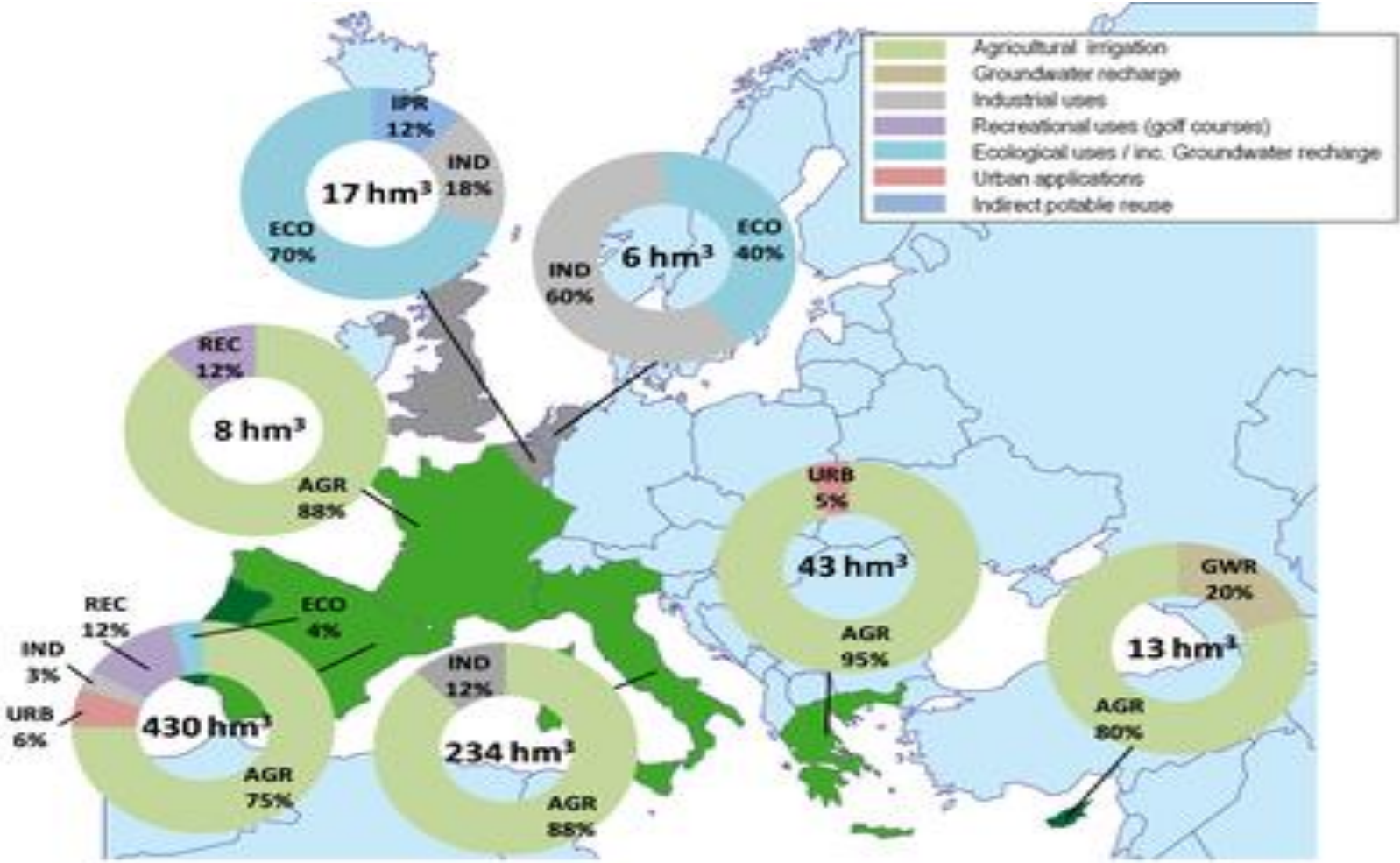
Setting the stage...



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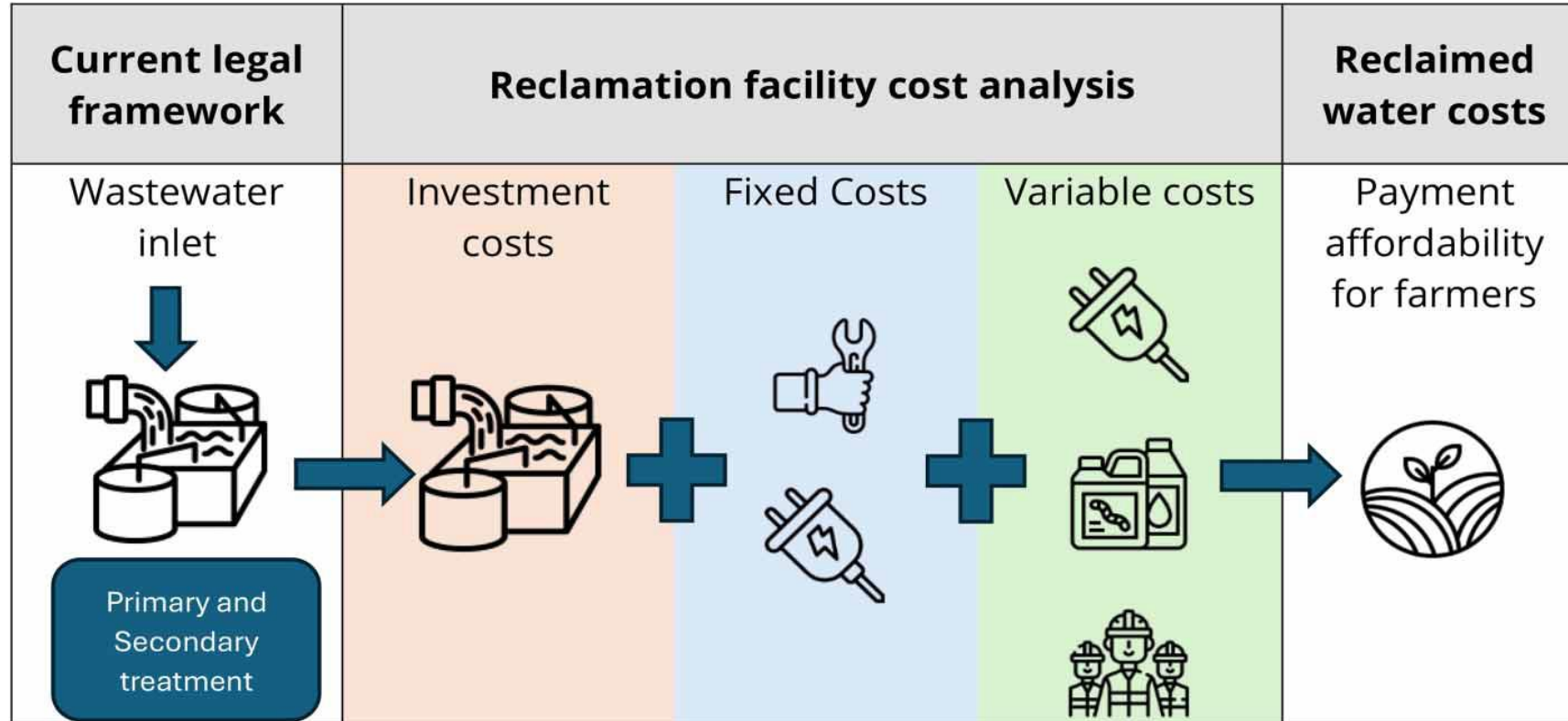
Setting the stage...



How much?



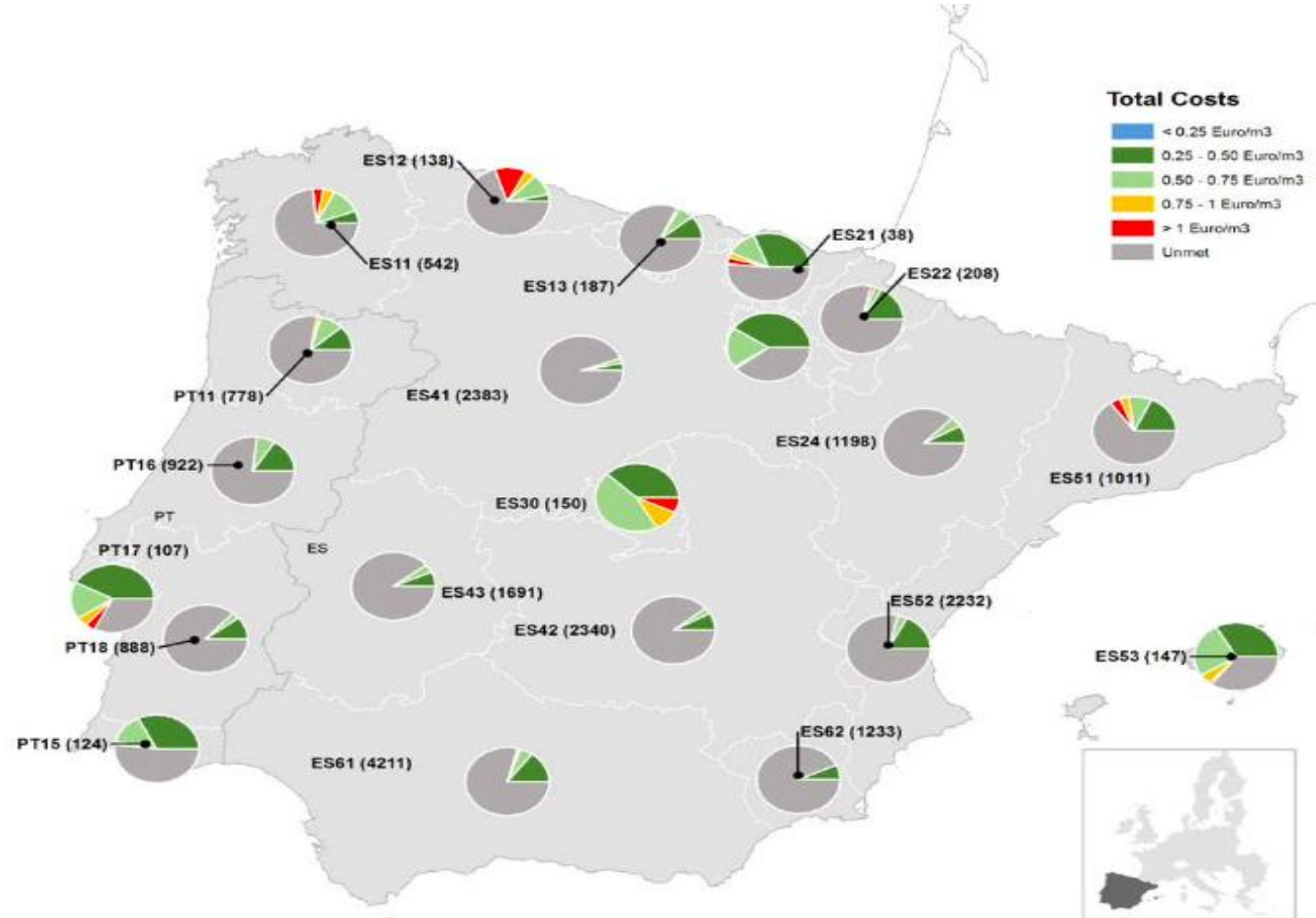
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Dir 2000/60 Dir 91/271 New Regulation EU 2020/741 on water reuse



How much?



Source: Pistocchi, et al. (2018). *The potential of water reuse for agricultural irrigation in the EU. A Hydro-Economic Analysis*, JRC, Publications Office of the European Union, Luxembourg.



How much?



Table 3 Cost of reclamation treatment in southern Spain

Location of the irrigation association	Volume (hm ³)	Estimated operation cost (EUR/m ³)
Guadalquivir RB - Cordoba	1	0.20
Atlantic Andalusian RB - Cadiz	5	0.11
Mediterranean Andalusian RB - Almeria	6	0.12
Mediterranean Andalusian RB - Granada	0.5	0.21
Mediterranean Andalusian RB - Malaga	10	0.10

Source Authors' own estimation based on interviews with WWTP operators

SOURCE: Expósito, A., Díaz-Cano, E. & Berbel, J. The Potential use of Reclaimed Water for Irrigation Purposes: Is it Overestimated?. *Water Resources Management* (2024).
<https://doi.org/10.1007/s11269-024-03878-w>



How much?



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Case study: Andalusian Mediterranean Basins



SOURCE: Expósito, A., Lorenzo, A. & Berbel, J. How much does reclaimed wastewater cost? A comprehensive analysis for irrigation uses in the European Mediterranean context. *Water Reuse* (2024).



How much?



Table 2. Tertiary treatment and disinfection costs in the minimum cost scenario

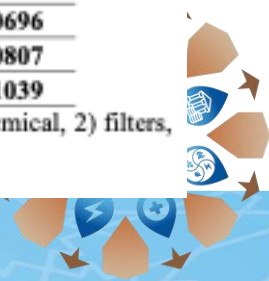
		Treatment capacity (Mm ³)			
		EUR/unit	1	5	10
Investment unit cost (EUR/m ³)			0.60	0.43	0.36
Total investment (EUR)			601,100	2,168,592	3,616,312
Fixed costs					
Energy (power)	<i>kW</i>	40	50.0	87.8	135.0
Maintenance			11,421	41,203	68,710
Fixed-cost subtotal (EUR)			13,421	44,714	74,110
Indirect costs (EUR/m ³)			2,550	8,496	14,081
Fixed-cost Total (EUR)			15,971	53,210	88,191
Fixed-cost Total (EUR/m³)			0.0160	0.0106	0.0088
Variable costs					
Operational personnel	<i>Hours/year</i>	35	800	844	900
Technical personnel (10%)	<i>Hours/year</i>	54	80	84	90
Filter cloths	<i>unit</i>	750	7	35	70
UV lamps	<i>unit</i>	830	9	45	90
Sampling and analyses	<i>EUR/year</i>		6,000	6,044	18,000
Variable-cost subtotal (EUR)			51,040	103,760	181,560
Variable-cost subtotal (EUR/m ³)			0.0510	0.0208	0.0182
Sodium hypochlorite	<i>Kg/m³</i>	0.30	0.0600	0.0600	0.0600
Electricity consumption	<i>KWh/m³</i>	0.12	0.2000	0.1609	0.1120
Return flows and stops			0.0019	0.0022	0.0011
Variable-cost subtotal (EUR/m ³)			0.0950	0.0603	0.0507
Indirect costs (EUR/m ³)			0.0180	0.0114	0.0096
Variable-cost Total (EUR/m³)			0.1130	0.0717	0.0603
Total Operating Cost (EUR/m³)			0.1290	0.0823	0.0691
Total Cost, incl. depreciation (EUR/m³)			0.1675	0.1101	0.0923

Source: Authors' own. Calculations consider four stages of treatment: 1) physical-chemical, 2) filters, 3) UV lamps, and 4) final chlorination.

Table 3. Tertiary treatment and disinfection costs in the maximum cost scenario

		Treatment Capacity (Mm ³)			
		EUR/unit	1	5	10
Investment unit cost (EUR/m ³)			0.60	0.43	0.36
Total investment (EUR)			601,100	2,168,592	3,616,312
Fixed costs					
Energy (power)	<i>kW</i>	50	50.0	87.8	135.0
Maintenance			14,426	52,046	86,791
Fixed-cost subtotal (EUR)			16,926	56,435	93,541
Indirect costs (EUR/m ³)			3,216	10,723	17,773
Fixed-cost Total (EUR)			20,142	67,158	111,314
Fixed-cost Total (EUR/m³)			0.0201	0.0134	0.0111
Variable costs					
Operational personnel	<i>Hours/year</i>	35	1,000	1,444	2,000
Technical personnel (10%)	<i>Hours/year</i>	54	100	144	200
Filter cloths	<i>unit</i>	750	7	35	70
UV lamps	<i>unit</i>	830	9	45	90
Sampling and analyses	<i>EUR/year</i>		9,000	9,444	18,000
Variable-cost subtotal (EUR)			62,120	131,400	226,000
Variable-cost subtotal (EUR/m ³)			0.0621	0.0263	0.0226
Sodium hypochlorite	<i>Kg/m³</i>	0.30	0.0600	0.0600	0.0600
Electricity consumption	<i>KWh/m³</i>	0.15	0.2000	0.1609	0.1120
Return flows and stops			0.0024	0.0022	0.0011
Variable-cost subtotal (EUR/m ³)			0.1125	0.0706	0.0585
Indirect costs (EUR/m ³)			0.0214	0.0134	0.0111
Variable-cost Total (EUR/m³)			0.1339	0.0840	0.0696
Total Operating Cost (EUR/m³)			0.1540	0.0975	0.0807
Total Cost, incl. depreciation (EUR/m³)			0.1925	0.1252	0.1039

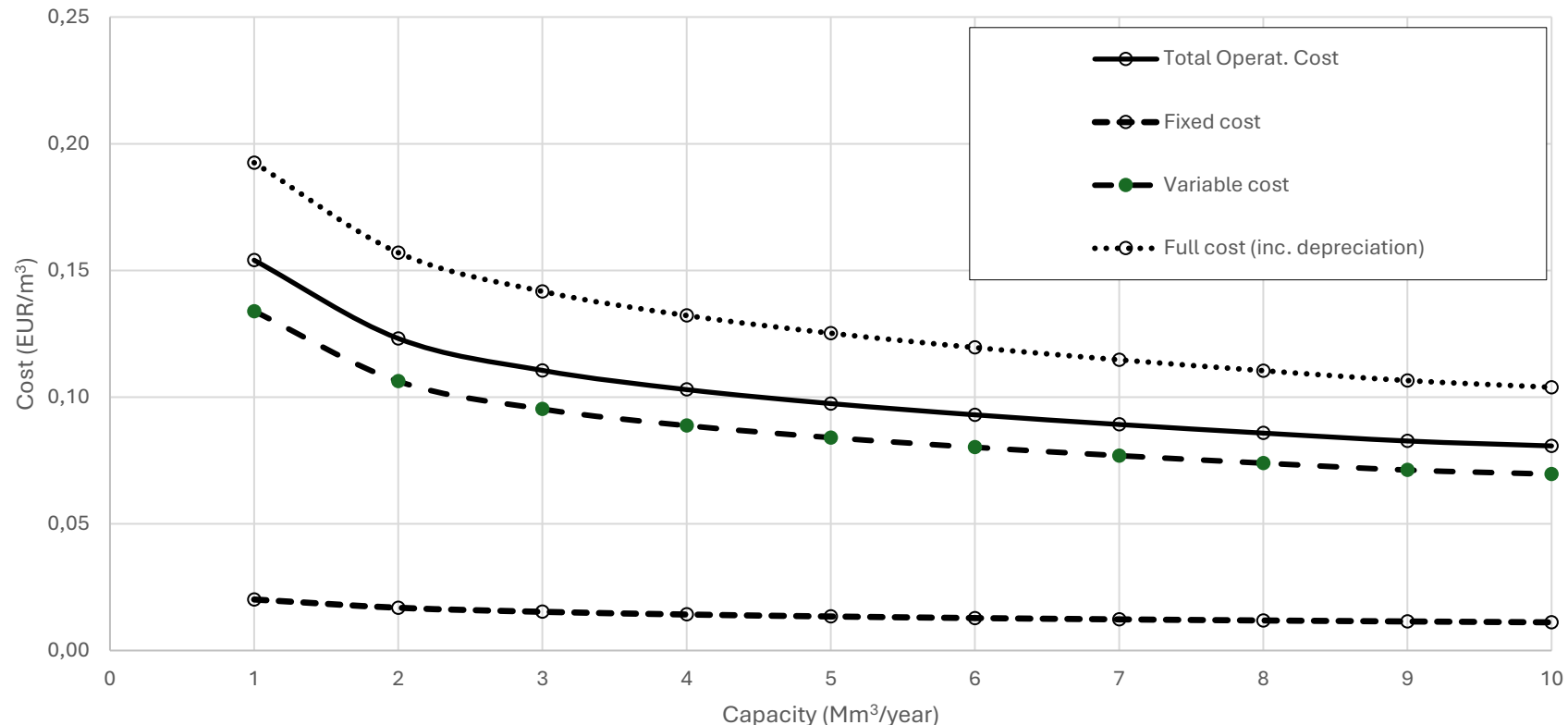
Source: Authors' own. Calculations consider four stages of treatment: 1) physical-chemical, 2) filters, 3) UV lamps, and 4) final chlorination.



How much?



Figure. Evolution of costs and WWTP capacity (maximum cost scenario)



SOURCE: Expósito, A., Lorenzo, A. & Berbel, J. How much does reclaimed wastewater cost? A comprehensive analysis for irrigation uses in the European Mediterranean context. *Water Reuse* (2024).



Is it affordable?

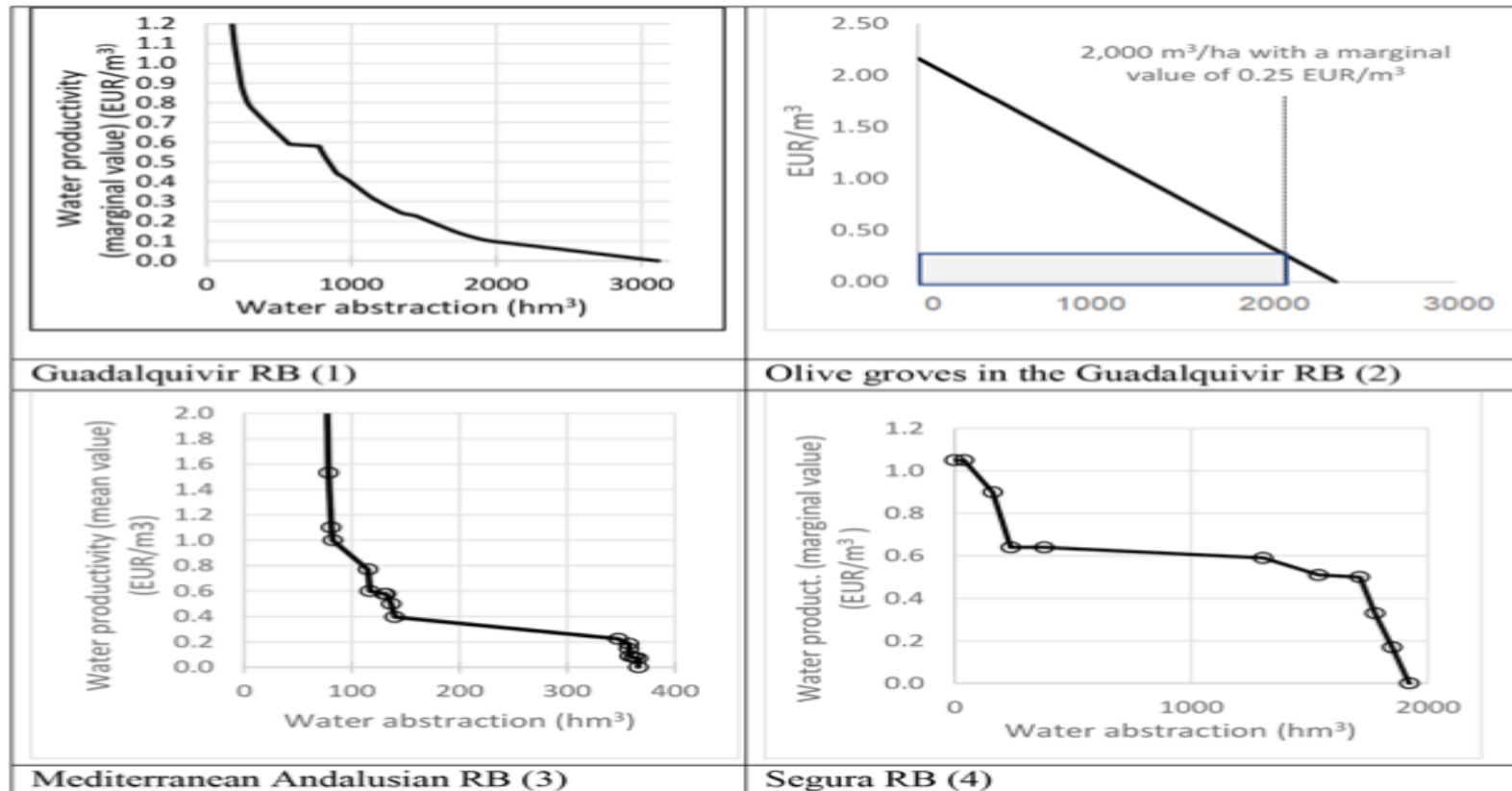


Fig. 2 Water demand functions estimated by: (1) Martínez-Dalmau et al. (2023); (2) Expósito and Berbel (2017); (3) Authors' own; and (4) Calatrava and Martínez-Granados (2012)



Beyond monetary costs...



Year	Internalities (4% Discount)		Externalities (4% Discount)	
	Costs (EUR)	Income (Water Selling) (EUR)	Eutrophication (EUR)	CO ₂ _eq Footprint (EUR)
5	23,008.20	21,575.59	33,297.38	3952.55
6	22,123.27	20,745.76	32,016.71	4099.65
7	21,272.37	19,947.84	30,785.30	4229.58
8	20,454.20	19,180.62	29,601.25	4522.40
9	19,667.50	18,442.90	28,462.74	4786.43
10	18,911.06	17,733.56	27,368.02	5023.47
11	18,183.71	17,051.50	26,315.40	5235.19
12	17,484.34	16,395.67	25,303.27	5423.20
13	16,811.86	15,765.07	24,330.07	5575.62
14	16,165.25	15,158.72	23,394.30	5708.30
15	15,543.51	14,575.69	22,494.51	5822.53
Total NPV EUR m ³	-540,570.57 -0.21	291,857.67 0.11	450,420.88 0.17	68,332.77 0.03
		Total internalities	-248,712.90 EUR	
		Total externalities	518,753.65 EUR	
		Total	270,040.75 EUR	

PROYECTO RICHWATER (HORIZONTE 2020). LA AXARQUÍA (MÁLAGA). SOURCE: Lorenzo, A. & Expósito, A. (2025). A comprehensive environmental cost-benefit analysis of using reclaimed water for irrigation in southern Spain. *Environments*, 12, 130.



Challenges and Opportunities



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- 💧 The real potential (1,200–1,300 hm³) is lower than the estimate provided by the EU (2,000–3,300 hm³).
- 💧 Risks of overestimation: Poor investment decisions in infrastructure that later ends up underused; unmet social and political expectations, especially during drought conditions; inefficiencies in water planning when assuming a supply that cannot be fully utilized; and conflicts among stakeholders (urban, agricultural, environmental) over the allocation of an overestimated resource.
- 💧 Study of 6 WWTPs (EDARs) in Andalusia: operating costs range between €0.07 and €0.13/m³ without considering investment, and up to €0.19/m³ when amortization is included. If transport and storage costs are added (≈€0.15/m³), the final cost can reach €0.25–0.30/m³.



Challenges and Opportunities



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- 💧 Farmers' willingness to pay depends on the economic productivity of water in their crops. According to recent studies:
- 💧 Greenhouse vegetables: up to €1.50/m³ → viable.
- 💧 Subtropical fruit: €0.60/m³ → reasonable.
- 💧 Cereals or pasture: <€0.20/m³ → not viable.
- 💧 **Crops must achieve a productivity level above €0.30/m³ to be viable. Regeneration is only profitable in areas with structural water scarcity and high-value crops.**



Challenges and Opportunities



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- 💧 **We need more realistic models to estimate the regeneration potential, incorporating hydrologic, economic, and governance factors.**

Recommendations:

- 💧 Prioritize coastal areas where treated effluent is discharged into the sea.
- 💧 Avoid duplications with indirect reuse.
- 💧 Provide public co-financing to make pricing schemes viable.
- 💧 Ensure coherence between environmental and agricultural objectives.
- 💧 Design realistic tariffs with cost-recovery mechanisms.



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Are We Overestimating Reuse Volumes?

Authors: Julio Berbel (UCO)

Marrakech, 2nd of December, 2025

Estimations of potential wastewater reuse in Spain



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Source	Potential reuse (hm ³)	
	EU	Spain
EC (2018)	6,000	-
Pistocchi et al. (2017) Cost <0.50EUR/m³	6,620	2,054
Pistocchi et al. (2017) Cost <0.75EUR/m³	10,405	2,917
Pistocchi et al. (2017) Cost <1.00EUR/m³	11,522	3,114
Pistocchi et al. (2017) Any Cost	13,090	3,295
Plan nacional de reutilización de aguas (España)	-	1,400 ²
Uso actual: EU (2016), Spain (2020)	1,100	530 ¹

Source: [1] INE (2020); [2] MARM (2010)



Methodology



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Include the role of
return flows with
basin wide
perspective

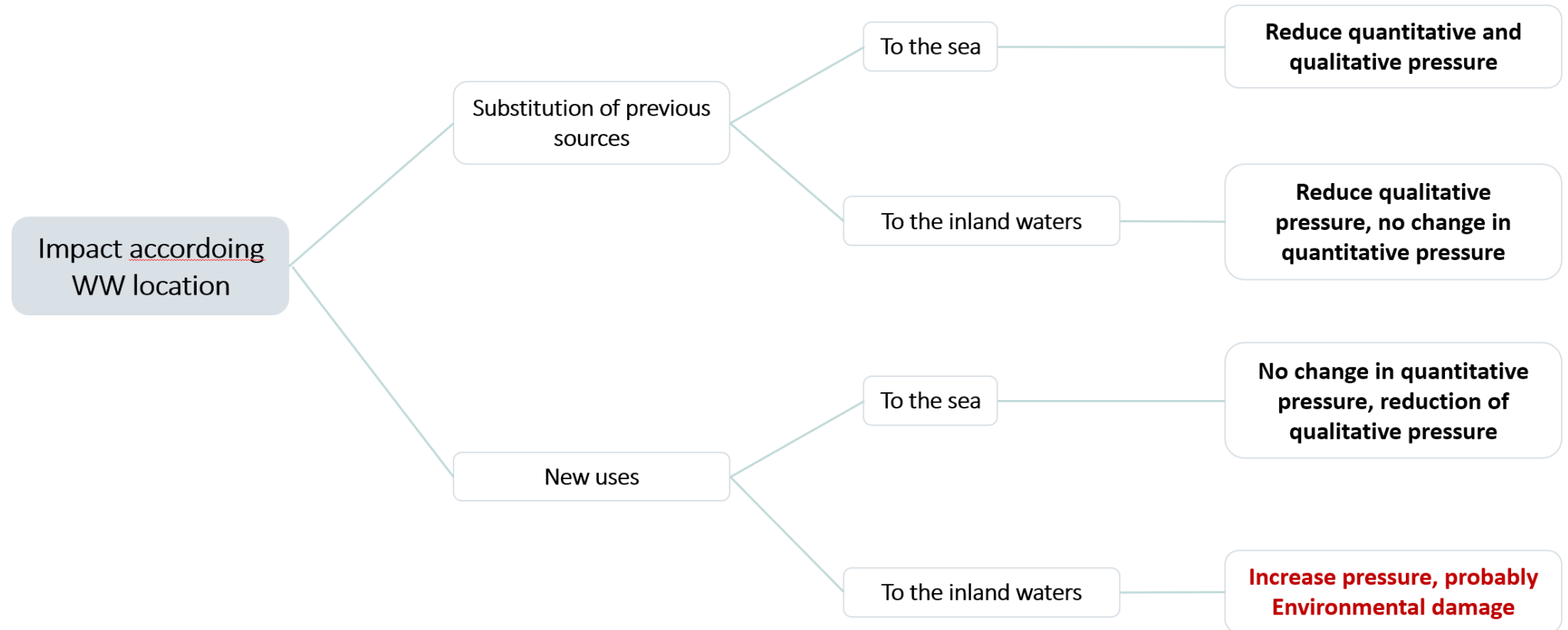
Asses the
availability and cost
of alternative
renewable resources

Estimate willingness
to pay (water
productivity)





Impact according location of WWTP





Estimated cost of WW treatment

Localización de la Asociación de Regantes	Volumen (hm ³)	Costes estimados de operación (EUR/m ³)
Cuenca del Guadalquivir - Córdoba	1	0,20
Cuenca Atlántica Andaluza - Cádiz	5	0,11
Cuenca Mediterránea Andaluza - Almería	6	0,12
Cuenca Mediterránea Andaluza - Granada	0,5	0,21
Cuenca Mediterránea Andaluza - Málaga	10	0,10





Conventional resources cost (at destination)

Cuenca	Coste (EUR/ha)				Cost (EUR/m ³)	
	GW	Surface	Network	Total	Groundwater	Surface
Ebro	828,9	12,3	49,1	61,4	0,1488	0,0110
Duero	499,7	46,1	19,9	66,0	0,0946	0,0125
Júcar	383,5	16,2	80,7	96,8	0,0744	0,0188
Tajo	541,2	67,0	36,5	103,5	0,1035	0,0198
Guadiana	231,6	102,5	19,1	121,6	0,0485	0,0254
Guadalquivir	743,8	69,9	101,2	171,1	0,1503	0,0346
Segura	789,2	150,6	33,8	184,4	0,1632	0,0381
Media Nacional	500,2	56,4	49,7	106,1	0,0909	0,0207



Result



Región	Wastewater	Return to teh sea	Reused 2024	Potential tecnical	Economic potential
Andalucía	699	248	36	233	233
Islas Baleares	113	42	51	37	37
Islas Canarias	116	88	28	82	82
Cataluña	706	321	38	303	303
Valencia	468	114	199	99	99
Murcia	115	2	105	0	0
Ceuta y Melilla	16	16	0	15	15
Mediterrán + Canary	2.233	831	457	769	769
Central and north Spain	2.644	513	75	487	0
Total Spain	4.877	1.344	532	1.256	769





Conclusions Estimated volume (hm³)



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Combining Water Blending and Innovative Technologies for the Sustainable Use of Desalinated Water in Irrigation

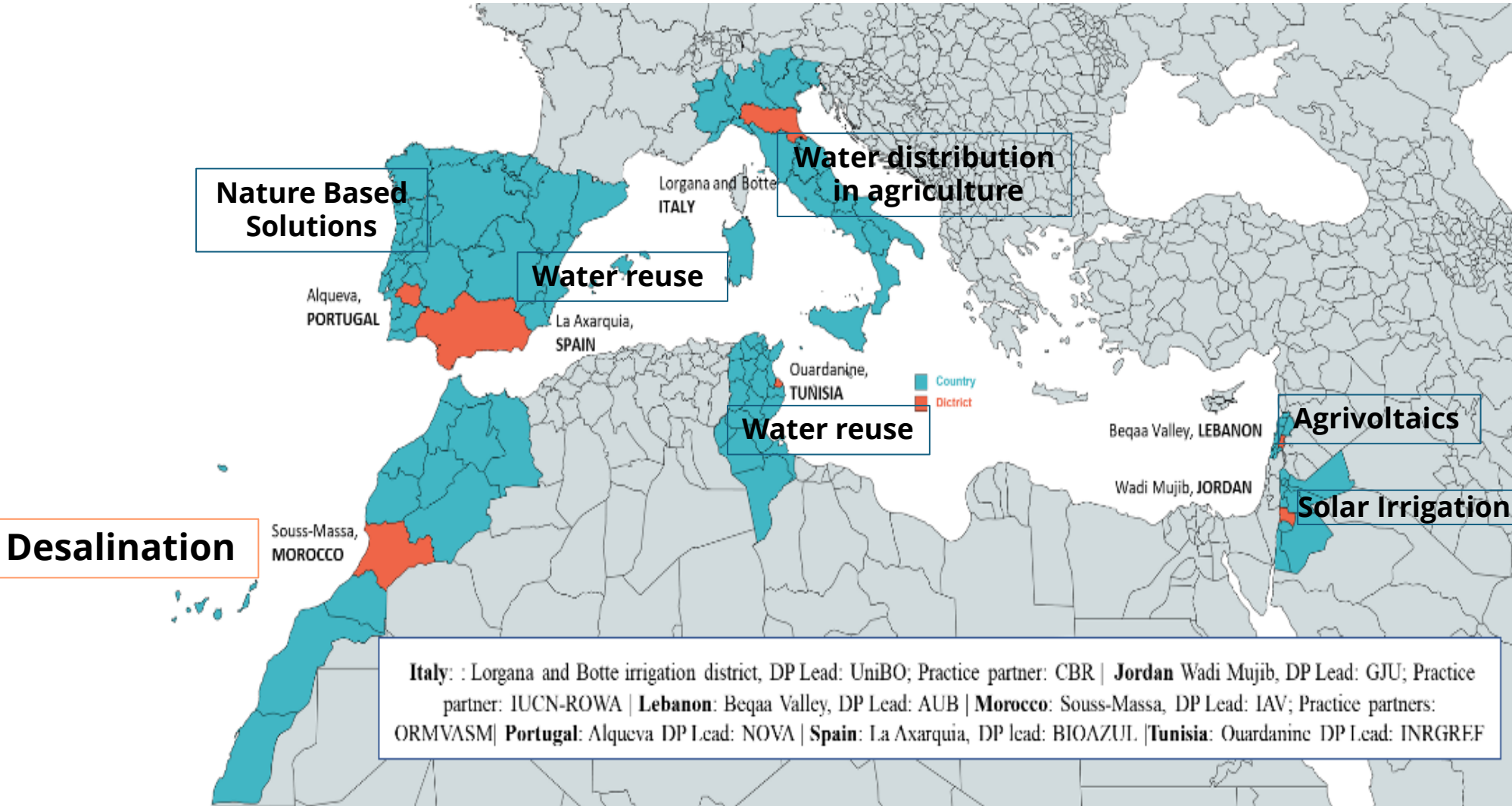
Author: Houda Taimourya (IAV)

Marrakech, 2nd of December, 2025

Sustainable Use of Desalinated Water in Irrigation

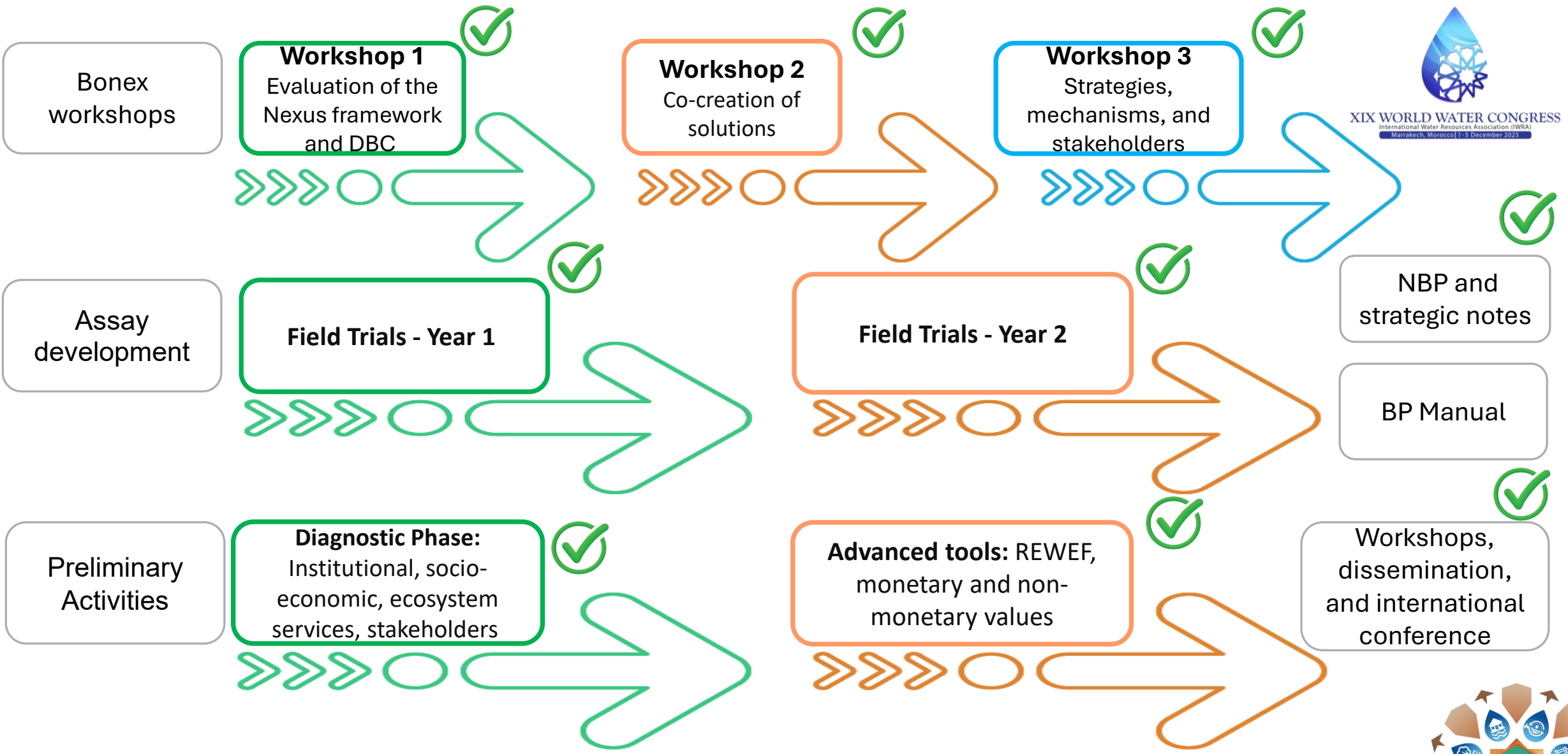


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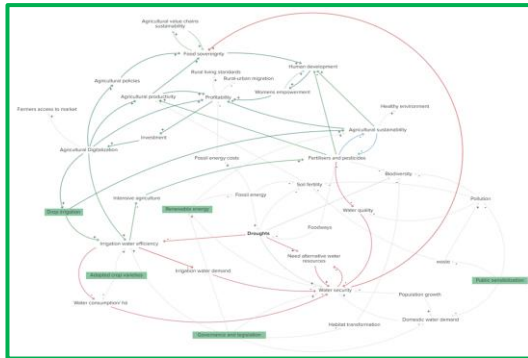


Workshop 1

Evaluation of the Nexus framework and DBC



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Acheived Work - Graduation project



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1. The use of a mixture of groundwater and desalinated water at different ratios (25%-75%, 50%-50%, and 25%-75%), for zucchini plant.



Travail de Fin d'Études présenté pour l'obtention du diplôme d'Ingénieur en Management de la production végétal et de l'environnement

Évaluation de l'effet des mélanges d'eau de puits et d'eau de dessalement sur l'irrigation de la courgette (*Cucurbita pepo*): Une étude basée sur l'approche NEXUS WEFE (Water-Energy-Food-Ecosystems)

Présenté et soutenu publiquement par : ELATRASSI Aya

Devant le jury composé de :

- | | | |
|---------------------|---------------|-------------------|
| Pr. TAIMOURYA Houda | Présidente | IAV Hassan II |
| Pr. LAHLOU Oujam | Encadrant | IAV Hassan II |
| Pr. KHOUYA Khadija | Encadrante | IAV Hassan II |
| Pr. ZAKRI Bahija | Co-encadrante | IAV Hassan II-CHA |
| Pr. ZIM Jamaa | Examinateur | IAV Hassan II-CHA |
| Pr. BOURZIZA Rqja | Examinatrice | IAV Hassan II |

Le 9 octobre 2023



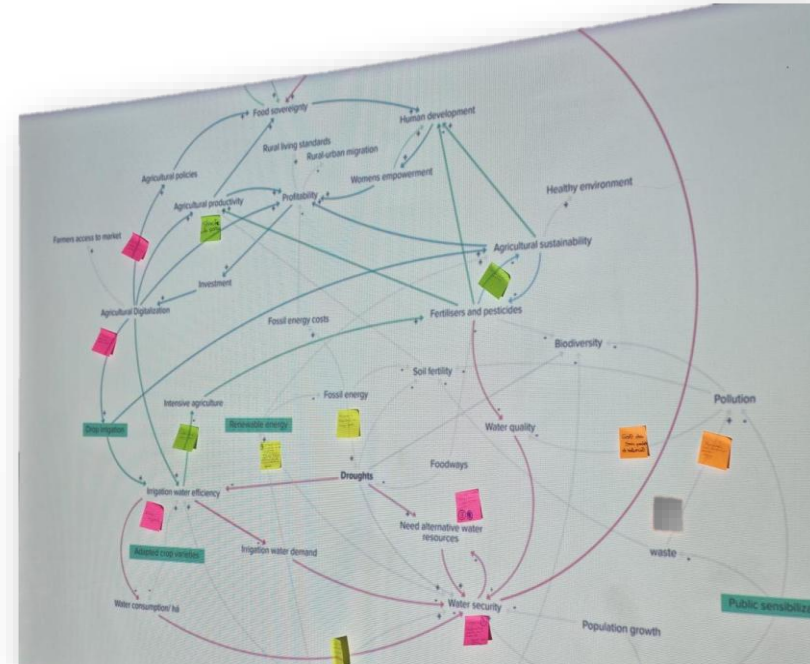
Workshop 2

Co-creation of solutions



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1	solar energy	Renewable energy
2	Biofertilizers and biostimulants	Agricultural productivity
3	Improvement of Soil Bacteria (PGPR)	Agricultural productivity
4	Varieties adapted for soil-less system	Agricultural productivity
5	Varieties Adapted to Desalinated Water Irrigation	Agricultural productivity
6	Compost	Agricultural productivity
7	Aquaponics	Water security
8	Recycling of plastic waste using nanotechnology	Agricultural sustainability
9	improving water quality using nanomolecular technology	Water quality
10	magnetic water treatment	Water quality
11	water retainer	Water security
12	Recycling desalinated water	Water security
13	Smart greenhouse technology	Agricultural sustainability
14	widespread use of weather stations	Agricultural sustainability
15	Electricity generation from brackish water	Renewable energy



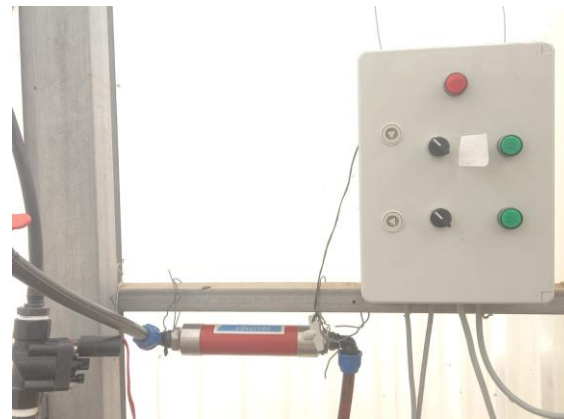
Acheived Work - Graduation project



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2. The use of a mixture of groundwater and desalinated water at different ratios (50%-50% and 25%-75%), with the integration of solar energy, magnetically treated water and a biofertilizer for zucchini plant.

3. Using a mixture of groundwater and desalinated water at one proportion (50%-50%) with 100% groundwater as control, using zucchini, solar energy and three soil types with different gypsum concentrations



Acheived Work - Graduation project



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Final study project applied for the State Engineering
Diploma in Agronomy

Option: Plant Production and Environment Management

Enhancing the efficiency of desalinated water for zucchini (*Cucurbita pepo* L.) production in soilless systems: A NEXUS WEF-E (Water-Energy-Food-Ecosystems) approach integrating magnetic treatment, solar energy, and biofertilizers

Presented and defended publicly by:

AIT LHOUSSAINE Asmae

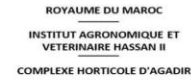
Before the jury members:

Pr. TAIMOURYA Houda	Presidente	IAV Hassan II, Rabat
Pr. ENNAMI Mounia	Supervisor	IAV Hassan II, Rabat
Pr. KHOUYA Khadija	Co-Supervisor	IAV Hassan II-CHA
Pr. ZAKRI Bahija	Co-Supervisor	IAV Hassan II-CHA
Pr. BEN-GHABRIT Salmane	Reviewer	IAV Hassan II, Rabat
Dr. ELARABI Elmahdi	Reviewer	ORMVASM
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September 2024

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المملكة المغربية
معهد الحسن الثاني
للزراعة والبيطرة
مراكش أكادير

Mémoire de fin d'études

Présenté pour l'obtention du diplôme d'ingénieur agronome

Option : Horticulture

54^{ème} promotion

Evaluation des effets de différentes doses de gypse et de l'irrigation à l'eau de mer dessalée sur les paramètres de croissance et de rendement du haricot vert (*Phaseolus vulgaris*) conduit sous serre.

Préparé et soutenu publiquement par :

HAROUNA MAAZOU Leilatou

Devant le jury composé de :

Pr AMINZOU S.	IAV Hassan II- CHA	Président
Pr. ZAKRI B.	IAV Hassan II- CHA	Encadrante
Pr. KHOUYA K.	IAV Hassan II- CHA	Co-encadrante
M. TALHAOU C.	Société Badra	Examinateur

Juillet 2024

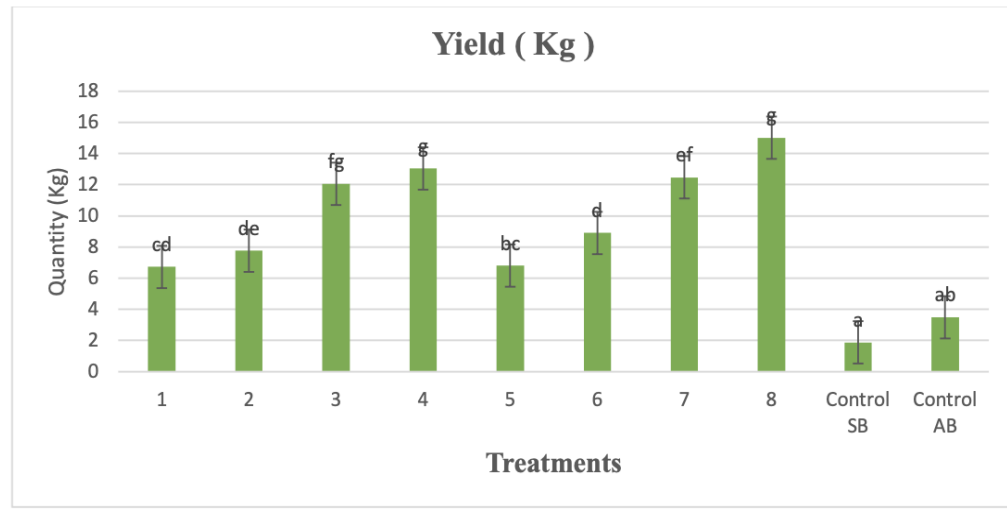
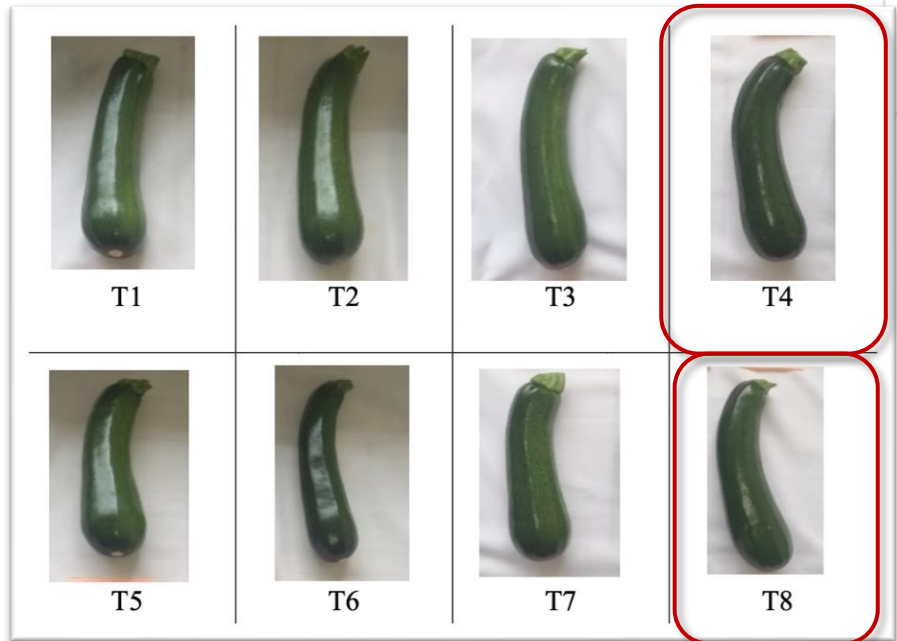
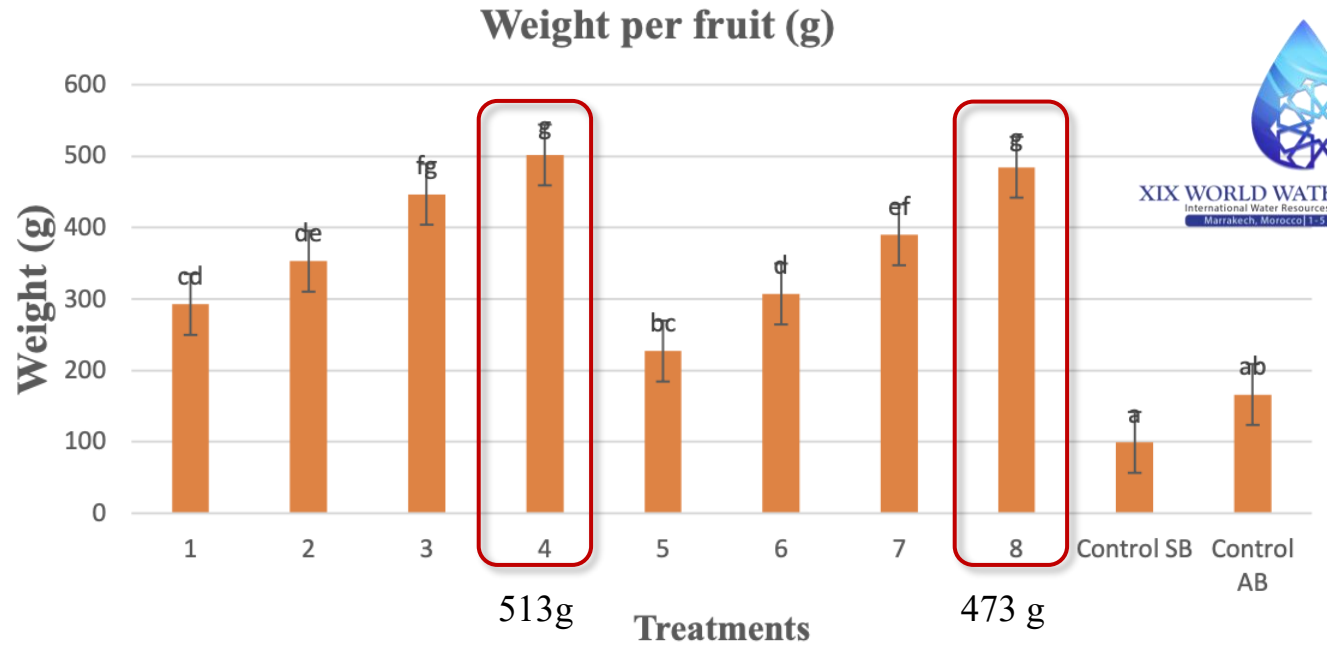
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Treatments	
T1	50%W - 50%D; SM; SB
T2	50%W - 50%D; SM; AB
T3	50%W - 50%D; AM; SB
T4	50%W - 50%D; AM; AB
T5	75%W - 25%D; SM; SB
T6	75%W - 25%D; SM; AB
T7	75%W - 25%D; AM; SB
T8	75%W - 25%D; AM; AB
Control	100%W; SB
Control	100%W; AB



Workshop 3

Strategies, mechanisms, and stakeholders

Mechanisms and strategies to facilitate, within the Nexus WEFe framework, the integrated implementation of desalinated water and other technological innovations.



XIX WORLD WATER CONGRESS
International Water Resources Association (IWRA)
Marrakech, Morocco | 1-5 December 2025



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Kingdom of Morocco



Ministry of
Equipment and Water

Challenges of water reuse in Andalusia – Optimizing Fertilization in Agriculture: The Role of Nutrient Management with Reclaimed Water in the BONEX Project and opportunities created by BOOST-IN initiative.

Authors: Rafael Casielles and Antonia Lorenzo (BIOAZUL)

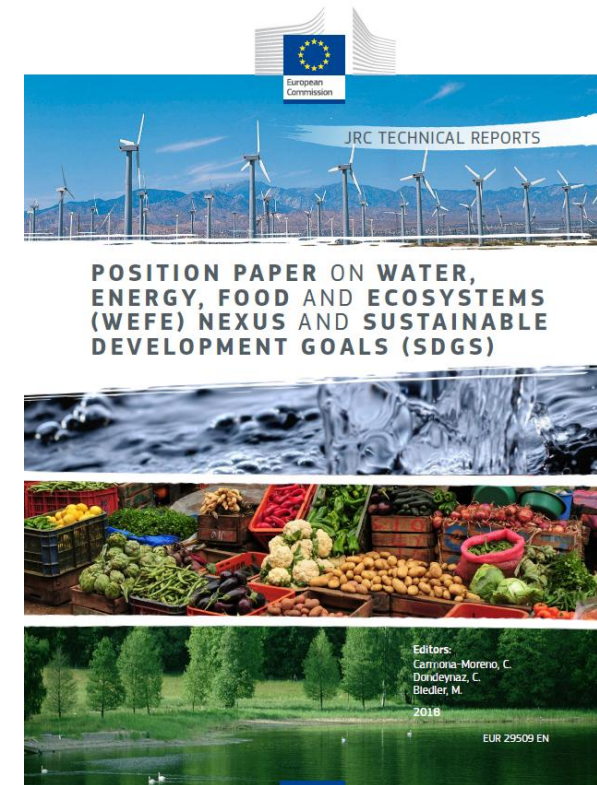
Marrakech, 2nd of December, 2025

REFLECTIONS ON WEFE NEXUS (FROM JRC REPORT)



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- WEFE Nexus integrates management and governance across the multiple sectors of food, energy, water, and ecosystems.
- Realisation of the **interconnectedness** between Water, Energy, Food Security, and Ecosystems.
- Nexus originally addressed the energy-water-food security (WEF) Nexus, but **ecosystems** are increasingly recognised as important for sustainability.
- A step beyond single sector planning towards a more **holistic** approach to planning.
- Strong and binding **coordination mechanism** (Nexus Policy Dialogues).





BONEX Mission

- Extensive literature focuses on the theoretical nexus concept, but tools to support its implementation in governance and practice are still in early phases of development
- BONEX aims to provide **practical and adapted tools**, examine concrete and context-adapted technological innovations, enhance policies and governance and facilitate WEFe Nexus practical implementation that balances the social, economic, and ecological trade-offs.



BONEX – WEFEE Bridging Framework



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- WEFEEF has been developed to collaboratively identify and assess interventions that solve WEFEE nexus problems and develop implementation pathways
- Practical tool for planners to integrate WEFEE dimensions in the analysis and select interventions
- Target group: Policymakers, governmental agencies, businesses, NGOs, and research institutes
- Participatory approach: legitimate and transparent decision-making process
- Interview templates, surveys, protocol for data collection protocol, etc.
- Different pathways for implementation, adaptability
- Available at: <https://bonex.qa.fullscreen.pt/>

Water-Energy-Food-Ecosystems Framework 2.0

Export as PDF

Welcome

INTRODUCTION

1. Introduction

1.1 Purpose of the WEFEEF 2.0

1.2 Structure of the WEFEEF 2.0

1.3 Guidance to use the handbook

1.4 Getting familiar with the WEFEE Nexus approach

2. First phase: Initiation

3. Second phase: Diagnosis

4. Third Phase: Identifying interventions

5. Fourth Phase: Assessment phase

6. Fifth phase: Implementation pathway

7. Definitions

8. References and additional documents

1. Introduction

As the **world's population grows** and **environmental challenges become more complex**, it becomes increasingly important to understand and manage the **interdependencies of natural resources**, in particular where resource use in one area can have unintended consequences in another. Some examples include:

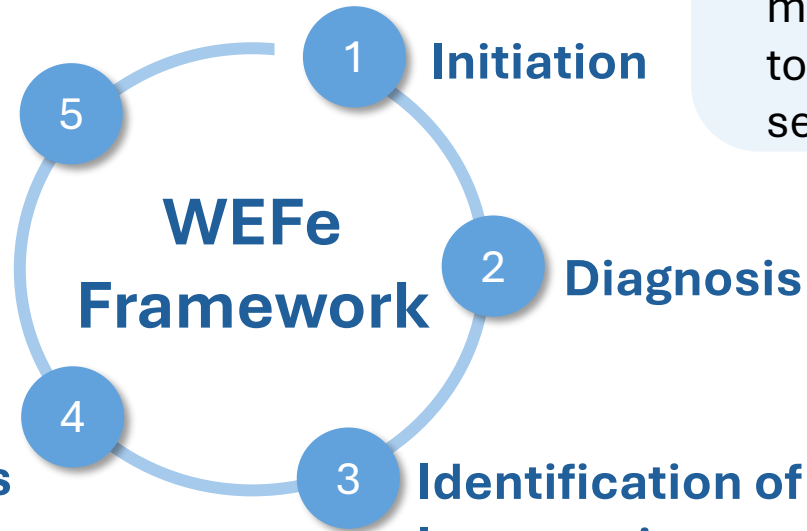
Intensive agricultural practices secure food production but have led to the depletion of water resources and degrading ecosystems in many parts of the world.



BONEX – WEFEE Bridging Framework

- Defining actions, responsibilities, key actors and resources to implement

Designing Implementation Pathways



- Define boundaries
- Analysing stakeholders
- Evaluating non-monetary values tied to ecosystem services

- Identifying WEFEE nexus challenges
- Participatory system mapping

- Assessing potential performance
- Identifying barriers and facilitators

- Identifying interventions based on i) regional experts, OR ii) analysts, OR iii) co-creation with stakeholders



Demonstration projects in BONEX



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BONEX Demonstration in Spain: RICHWATER DSS

- Calculation of fertiliser dosage based on nutrient analyses in reclaimed water
- Iteration – optimisation algorithm which can be adapted to different optimisation functions (e.g. costs, EC)
- Fertilisers savings: Reclaimed water supply N, P, K, Ca, Mg, Fe, Zn, etc. -> 68–79% reduction.
- Avoid over-fertilisation of crops: minimise eutrophication risks
- Lower dependency from chemical fertilisers: lower CO2 emissions
- Increased sustainability of agriculture



BONEX Demonstration in Spain: RICHWATER DSS

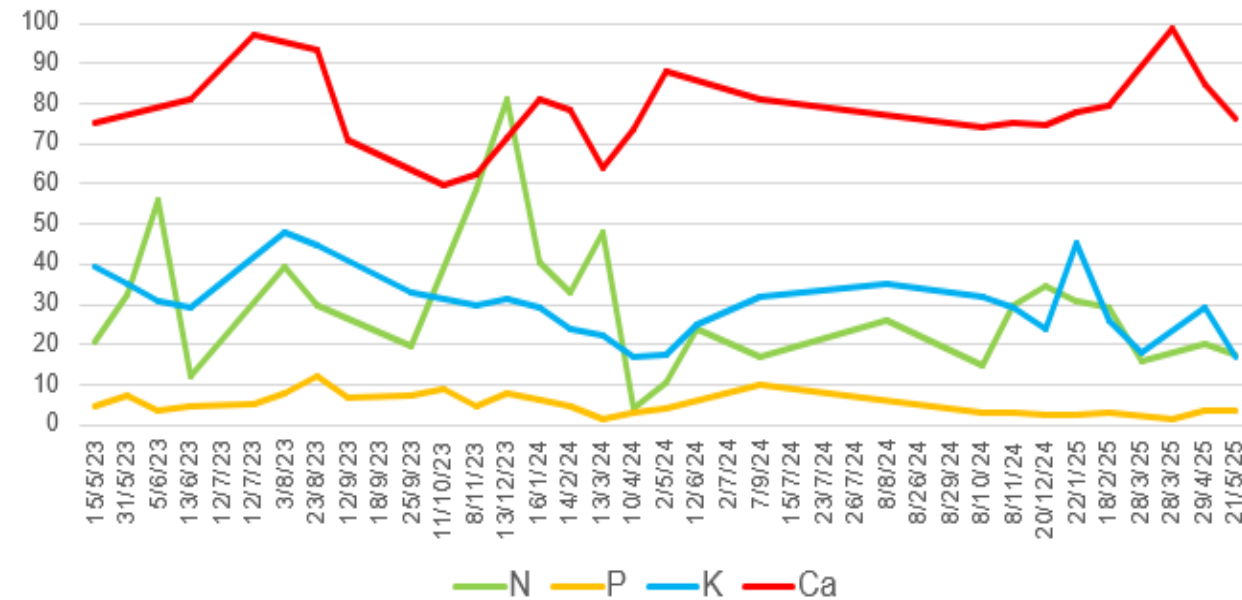


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- 70% of chemical fertilisers replaced
- Average saving of 75% of fertiliser costs
- Reduction of CO2 emissions

Mango	T1 (€/ha)	T2 (€/ha)	Saving (%)
Abril	92	25	73
Mayo	92	25	73
Junio	58	39	33
Julio	25	0	100
Agosto	25	3	87
Septiembre	25	3	87
Total	317	96	75

Reclaimed water composition 2023 - 2025

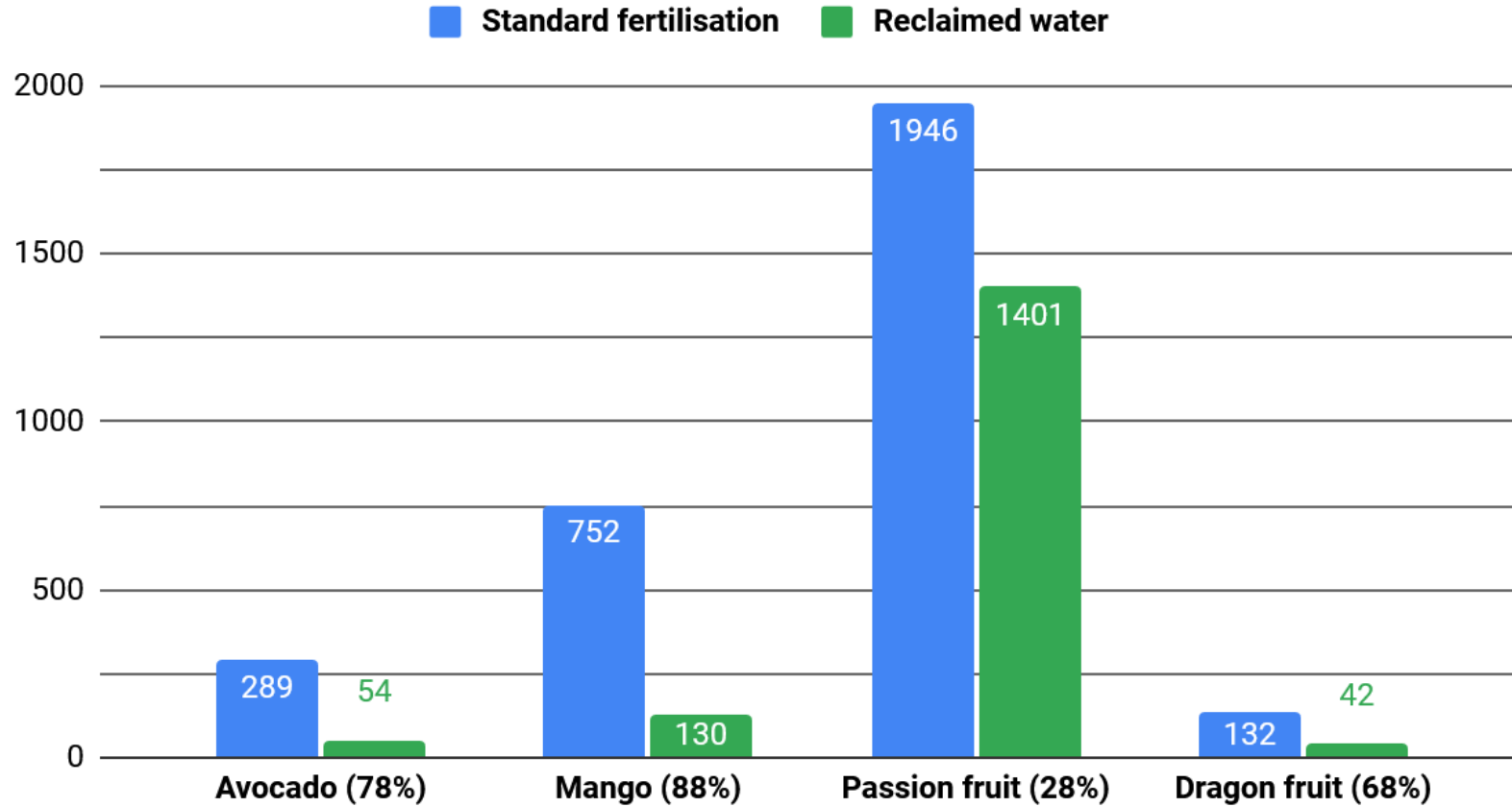


BONEX Demonstration in Spain: RICHWATER DSS



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Fertilization economic comparison (€/hectare)



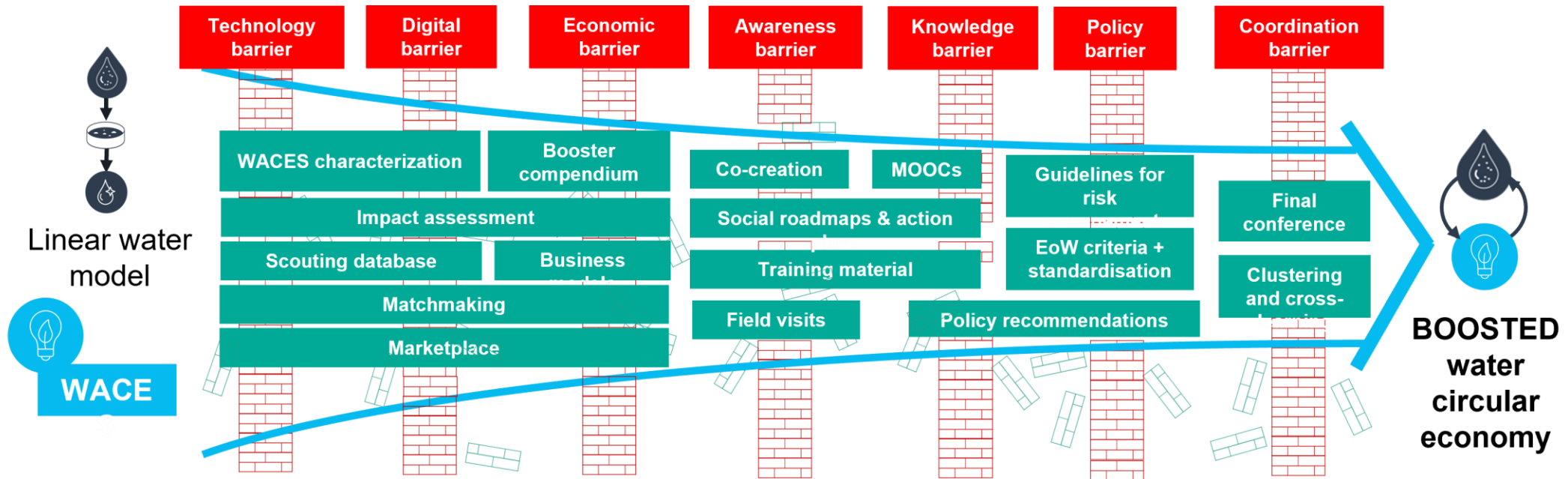


Boosting the uptake of innovative solutions in the context of water and circular economy

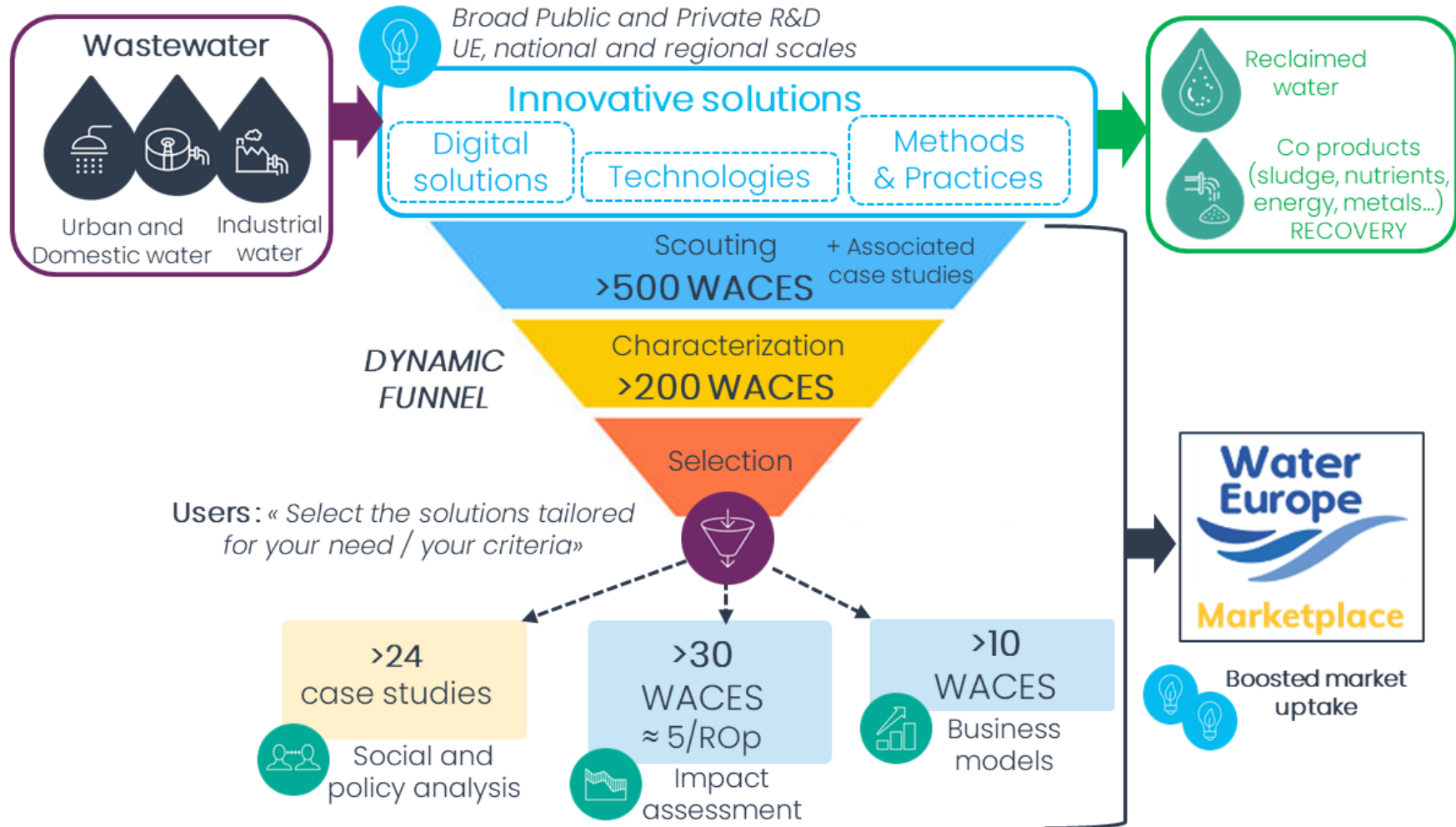
Title is self-explanatory!



The Project is focused on barriers



Funnel model approach



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Thank you!

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