

E 1.2.1 Analysis of opportunities in RIS3 and synergies between regions

Report on GT 1

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Authors

Ana Galvão (IST)
Filipe Felício (IST)
José Saldanha Matos (IST)

Contributions

Portuguese team (AdTA, ISA, ADRAL)
Spanish team (CENTA, AAC, FUERM)
French team (OIEau, UNILIM, IFTS)





Contenido

1.	Introduction	1
2.	Approach	2
2.1	Brief overview of RIS3 goals.....	2
2.2	Methodology.....	3
2.3	Questionnaire.....	4
2.4	Working meetings with institutions involved in the development of RIS3	5
2.4.1	Portuguese meeting with National Innovation Agency (ANI)	6
2.4.2	Portuguese meeting with CCDR-LVT	7
2.4.3	Spanish meeting with Joint Research Centre (JRC)	7
2.4.4	Spanish meeting with CAGPDS.....	8
2.4.5	Spanish meeting with AIDEA	8
2.4.6	French meeting with CCI - Nouvelle Aquitaine.....	9
2.4.7	French meeting with Region Nouvelle Aquitaine	10
3.	Identification of opportunities and synergies.....	12
3.1	Strategic areas identified in each one of the different regions.....	12
3.2	Opportunities available by region	14
3.3	Synergies between regions	18
4.	Final recommendations and conclusions.....	19



List of tables

Table 2.1 - List of the meetings held by each partner with the stakeholders.....	5
Table 3.1- Specialization and emergent areas of RIS3 identified in each region	12
Table 3.2- Water sector opportunities in Portugal.	14
Table 3.3 - Water sector opportunities identified in Spain.	15
Table 3.4 - Water sector opportunities identified in France.	16



List of abbreviations and acronyms

AAC - Agencia Andaluza del Conocimiento (Andalusian Agency of Knowledge, Spain)

ADRAL - Agência de Desenvolvimento Regional do Alentejo (Regional development Agency of Alentejo, Portugal)

AdTA - Águas do Tejo Atlântico, S.A. - (Portugal)

AIDEA - Agencia de Innovación y Desarrollo de Andalucía (Andalusian Innovation and Development Agency, Spain)

ANI - Agência Nacional de Inovação, S.A. (National Innovation Agency, Portugal)

CAGPDS - Consejería de Agricultura, Ganadería, Pesca y Desarrollo Sostenible (Andalusian Regional Ministry of Agriculture, Livestock, Fish and Sustainable Development, Spain)

CCDR-LVT- Comissão de Coordenação e Desenvolvimento Regional de Lisboa e Vale do Tejo (Coordination and Development Commission of Lisbon and Tejo Valley, Portugal)

CCI - Chambre de Commerce et d'Industrie (Chamber of Commerce and Industry, France)

CENTA- Centro de las Nuevas Tecnologías del Agua (Centre of New Water Technologies, Spain)

EHPADS - Établissement d'Hébergement pour personnes âgées dépendants (old-aged people continuous healthcare facilities)

ENEI - Estratégia Nacional de investigação e inovação para uma Especialização Inteligente (National Portuguese Strategy of research and innovation for a Smart Specialization)

EU - European Union

IAPMEI- Instituto de Apoio às Pequenas e Médias Empresas e à Inovação (Portugal)

IST - Instituto Superior Técnico (Portugal)

JRC - Joint Research Centre



MATE - Ministério do Ambiente e da Transição Energética (Ministry of Environment and Energy Transition, Portugal)

POR - Plano Operacional da Região (Regional Operational Plan, Portugal)

PPA - Parceria Pública para a Água (Portuguese Water Partnership)

R&D - Research and Development

RIS3 - Research and Innovation Strategies for Smart Specialization

UNILIM - Université de Limoges (France)



1. Introduction

Task GT1.2 has the main goal of analysing the opportunities in RIS3 and identify synergies between regions. This was achieved through meetings with stakeholders previously identified in GT 1.1. The identified opportunities and synergies within the water sector will then be used in GT 1.3 to build the TWIST strategy of common learning and results capitalization of RIS3.

This document describes the approach taken to involve the relevant stakeholders, namely through meetings with institutions directly involved in RIS3 implementation and regional actors. The information collected in the meetings was analysed in order to identify local opportunities within the water sector that can be expanded and reinforced by the Living Labs. Other synergies with TWIST project were identified and also the common opportunities and synergies that can be established between regions.



2. Approach

2.1 Brief overview of RIS3 goals

According to EU information regarding the Cohesion Policy 2014-2020, the Research and Innovation Strategies for Smart Specialization – RIS3 – are integrated, place-based economic transformation agendas that aim at five main goals:

- **Focus** policy support and investments on key national/regional priorities, challenges and needs for knowledge-based development.
- **Build** on each country/region's strengths, competitive advantages and potential for excellence.
- **Support** technological as well as practice-based innovation and aim to **stimulate private sector investment**.
- **Involve stakeholders** and encourage innovation and experimentation.
- Develop **evidence-based** agendas and include sound monitoring and evaluation systems.

To implement RIS3 the EU member countries had to define Regional Strategies to be able to focus at national and regional level. These strategies include relevant and valuable information regarding the specifications of each region and should be a starting point to address the stakeholders involved.

Each key point of the main RIS3 goals should be taken into account when defining opportunities and synergies within TWIST. This will also be relevant to define TWIST strategy, which is the final goal of GT1 and, therefore, it should also be considered when preparing the meetings with stakeholders.



2.2 Methodology

In order to identify opportunities for the water sector in RIS3 for each region, designated TWIST partners established working meetings with the relevant stakeholders identified in GT1.1. The goal of these meetings was to discuss the relevant characteristics of each region and identify regional opportunities in RIS3 within the water sector.

For establishing a common basis for all meetings, a questionnaire was developed to act as guideline and to allow an easier comparison of the information obtained. The questionnaire was drafted from the information that already exists in the regional RIS3 to act as a starting point to collect information and institutional views. The main goal of this approach was to identify each region's strengths and areas of potential interest and to request the stakeholders to update it and complement it with opportunities within the water sector. Emergent areas of interest, which are identified in some regional RIS3 reports were also considered for the meetings.

Building a common questionnaire from this information allowed the collection of information in a structured way that is comparable between regions and promoting an easier identification of synergies between regions and knowledge transfer between TWIST partners.

The main steps to develop working meetings with stakeholders were the following:

1. Identification of strategic areas included in each regions' RIS3;
2. For the strategic areas identified in step 1, identification of opportunities within the water sector;
3. Development of a questionnaire focusing the strategic areas and opportunities identified previously and including complementary questions regarding other opportunities and potential emergent areas identified by the stakeholders.

Once the information was collected it was analyzed by TWIST team to identify common opportunities and synergies that could potentiate or accelerate the implementation of RIS3 within the water sector.



2.3 Questionnaire

The first step of the questionnaire was to retrieve information for regional RIS3 reports of each TWIST area. The RIS3 reports were analyzed for the two regions involved in each country. Together with information retrieved from the RIS3 strategies, it was also found relevant to include questions regarding Public Procurement initiatives, which could be later used in GT3.

The final topic list used as guidance in each meeting was the following:

1. Identification of Specialization areas for the region

Do you agree?

Do you add/remove some?

Which ones are under direct or indirect influence of the institution that is being interviewed?

2. Identification of Emergent areas for the region - which ones are under direct or indirect influence of the institution that is being interviewed?

Do you agree?

Do you add/remove some?

Which ones are under direct or indirect influence of the institution that is being interviewed?

3. For each Specialization and Emergent area list the opportunities that can be related to the water sector

4. Ask the institution to complete/adjust: Global actions within the water sector in each region that can boost the development of RIS3

Central laboratory

Utilization of recycled water in cities

Promotion of water efficiency measures

5. Are there synergies within the region that can be established between the different areas?

6. Has your organization ever carried out an innovation procurement?

7. Does your organization need to find innovative solutions that improve some of the services provided to the citizen related to the water sector?



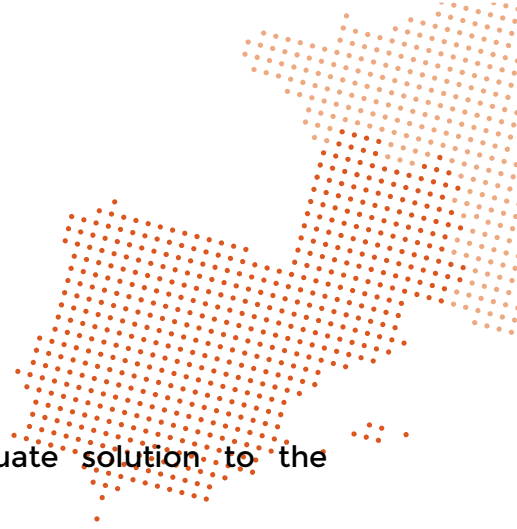
2.4 Working meetings with institutions involved in the development of RIS3

Meetings were carried out between institutional TWIST partners and administrative institutions responsible for the development of each regional RIS3 and also with regional actors involved in the development and implementation of RIS3. These work meetings were carried out in each of the three countries involved (ES, FR, PT), involving the institutions listed in table 2.1.

Table 2.1 - List of the meetings held by each partner with the stakeholders

Country	TWIST project partners	Stakeholder institution	Date
Portugal	AdTA PPA	ANI	09/01/2019 (ANI headquarters-Lisbon)
	AdTA IST PPA	CCDR-LVT	14/01/2019 (CCDR-LVT headquarters-Lisbon)
Spain	CENTA AAC	JRC	18/12/2018 (Seville)
		CAGPDS	20/02/2019 (Seville)
		AIDEA	06/03/2019 (AIDEA headquarters-Seville)
France	UNILIM	CCI - Nouvelle Aquitaine	11/01/2019
		Région Nouvelle Aquitaine	04/02/2019

The scientific institutions in TWIST project established the bridge with the scientific community by identifying technological opportunities, governance frameworks and relevant social issues in the water sector within each strategic area. These topics were standardized across countries as much as possible and included in the questionnaire discussed with the stakeholders. This approach allowed the connection between the stakeholders and the scientific community,



in order to deliver an efficient and technically adequate solution to the opportunities that were identified.

A brief description of each meeting is provided in the following chapters.

2.4.1 Portuguese meeting with National Innovation Agency (ANI)

The Portuguese National Innovation Agency (ANI) is the coordinator of the National Strategy of Research and Innovation for a Smart Specialization (ENEI). ENEI is a strategic plan that identifies the main topics to be developed in Portugal. All the public financing inserted in Portugal 2020 project have to be concordant with ENEI objectives.

At the time of the meeting, ENEI strategic plan was under a review process to establish the objectives after 2020. It was mentioned that they could give more indications about the strategic objectives present in ENEI and help identifying emergent areas or opportunities that could be currently underdeveloped. Hence, it was found the need for a future meeting once ANI could give some feedback about the review process.

It was also explained that ANI is not directly involved in any water sector project, but it provides the financing to projects in the water sector aligned with ENEI. Project TWIST should be aware of these financing opportunities.

At a regional level, Regional Operational Plans (POR) establish the development priorities in articulation with regional RIS3. In order to identify opportunities in the water sector for the Lisbon region, ANI suggested a meeting with CCDR-LVT, the coordinator of Lisbon POR.

Innovation public procurement is a major interest of ANI and the objective of its project iBUY. Although the project iBUY is not so developed in Portugal as, for instance, its similar in Spain, TWIST project has here an opportunity to acquire financing for innovative water technologies and the development of Living Labs.

ANI committed to deliver to TWIST a list of all the projects in the water sector that have been financed since 2014, including the projects of Co-Labs (a concept similar to TWIST Living Labs). These projects are mainly related with the introduction of new technologies directly in the markets and industries.

ANI also indicated IAPMEI as an institution who usually finances innovative projects in small and medium scale companies.



2.4.2 Portuguese meeting with CCDR-LVT

CCDR-LVT developed the Lisbon Research and Innovation Strategy for Smart Specialization (Lisbon RIS3) which identifies the strengths and opportunities of Lisbon region and promotes a regional development aligned with the directives for the Regional Operational Plan of Lisbon.

It was stated that Lisbon RIS3 has 5 domains and none of them involve directly the water sector, on contrary of what is present in ENEI. The potential links between TWIST and Lisbon RIS3 can be found in three of the lines of action addressed in the document:

- preservation and valorisation of marine resources;
- tourism and hospitality sector;
- advanced services provided to enterprises (transversal priorities domain);

It was also explained that it will be difficult for TWIST project to be financed under the Regional Operational Plan of Lisbon due to lack of domains directly related to the water sector. However, until the ending of 2020 it is expected a review of Lisbon RIS3 and, eventually, a redefinition of the priorities to include specifically the water sector.

CCDR also mentioned that the Circular Economy Action Plan of the Environment and Energetic Transition Ministry (MATE) is an interesting opportunity for TWIST project to get funding for its actions.

2.4.3 Spanish meeting with Joint Research Centre (JRC)

The Joint Research Centre (JRC) is one of the institutions leading the European INTERREG and RIS3 programs and responsible for the online platform Eye@RIS3. This platform presents all the INTERREG and RIS strategies of the European Union and their respective results.

It was explained the TWIST methodology for analysing the information presented in the different regional RIS3 strategies of each one of the TWIST partners regarding the identification of opportunities and synergies inside the water sector and contributing to the establishment of a TWIST Common Strategy, the principal outcome of the project.



JRC committed to collaborate with TWIST on presenting the results and other outcomes of the project inside the platform Eye@RIS3.

Thanks to this meeting it has been established a collaborative relation for the actual and future projects.

2.4.4 Spanish meeting with CAGPDS

The Regional Ministry of Agriculture, Livestock, Fishery and Sustainable Development (CAGPDS) referred the existence of a document that analysed the needs and opportunities inside the environmental sector for the different Spanish regions. This analysis could be very useful to establish the opportunities inside the water sector regarding TWIST project. Based on this document CAGPDS started to work on a on an environmental R&D research strategy which could be relevant for TWIST to consider in the TWIST Strategy to be developed.

CAGPDS committed to collaborate with the project TWIST providing the contacts of its departments of water resources and hydraulic infrastructures.

CAGPDS also alerted TWIST for the problem of being unaware of interesting projects like TWIST and their respective results. It considers that fact an obstacle to incorporate innovative measures inside administrative procedures.

2.4.5 Spanish meeting with AIDEA

The Agencia de Innovación y Desarrollo de Andalucía (AIDEA) is one of the institutions responsible for the elaboration and development of regional RIS3 strategies. This institution provides a new way of analysing the different Smart Specialization strategies in order to obtain the most detailed information possible: carry out the identification through the measures developed in the RIS3 document. The measures are much more concrete and that is what the TWIST strategy is about.

AIDEA referred that there is a comparative analysis document of the RIS3 of Andalusia, Algarve and Alentejo regions, in which ADRAL (partner in the TWIST project) has participated, which could be used as a basis for the analysis of the RIS3 of the six regions participating in TWIST. AIDEA will send this document or reference to CENTA and AAC.



AIDEA also mentioned that there are other transregional initiatives that have a similar objective to TWIST. In particular, it was discussed a project on nanomaterials whose main result is the development of an innovation strategy. The contact and reference document would be provided.

AIDEA was also interested in knowing the activity of Innovative Public Purchase of the TWIST project, so AAC explained the corresponding activity within the framework of the project.

On the part of the CENTA Foundation, the concept of the Living Labs was clarified to AIDEA, which they showed interest in deepening.

AIDEA, as part of the follow-up committee of the RIS3, comments on some of the points that may be relevant for the subject of the meeting.

2.4.6 French meeting with CCI - Nouvelle Aquitaine

Nouvelle Aquitaine's Chambre de Commerce et d'Industrie (CCI) is a public institution representing the interests of the industrial, commercial and services sectors based in Nouvelle Aquitaine region. CCI is involved in a regional working group on water and the chairman of this working group is the president of the CCI Haute Vienne. A "New Aquitaine Eco-Enterprise Network" is being set up as a result of the merger of Aquitaine Croissance Verte, the Pôle Environnement Nouvelle Aquitaine and the Pôle Eco-Industries. Although the formal constitution of this group had not been completed at the time of the meeting, it was under development.

After a brief presentation of TWIST project and the explanation of Living Labs concept, a discussion developed where both the importance of the water sector and the available opportunities were identified and summarized in 4 main topics:

- Agro-food sector;
- Water sector and the transition for a digital world;
- Tourism and leisure;
- New technologies industries;

The paper industry was referred as one of the main industries interested on innovative water treatment technologies. The subject of tourism and water management in the tourist industry was also addressed multiple times. It was



noted that this topic is identified in the innovation strategy for the region, and also part of the discussions between the different CCI.

The role of a living lab was also discussed, and two different understandings emerged, between a vision of a living lab for technology pilots (level TRL 4/5/6) or something further upstream, or a more conceptual role of generating innovations (TRL 0/1/2).

CCI suggested the presentation of the TWIST project on the event Cycl'Eau (10-11th April 2019).

CCI - Nouvelle Aquitaine is interested in following and collaborate with the TWIST project, being a direct contact with the industry and enterprises. TWIST shall take advantage of its knowledge about the region and its strong relations with all the important Nouvelle Aquitaine activity and political sectors.

2.4.7 French meeting with Region Nouvelle Aquitaine

The Nouvelle Aquitaine region has a council, elected for 6 years, responsible to manage the affairs of the region. It is the institution that developed the RIS3 strategies for the region.

The Environment Department considers two visions of the problems in the field of water: 1. Qualitative and 2. Quantitative.

Regarding the quality aspect, their vision is more oriented towards aquatic environments and the management of the environment in the broad sense. The major levers are the change of agricultural practices and both the limitation of domestic and wastewater impacts. Regarding the quantitative aspect, the impact of climate change on the use (agricultural, urban, industrial) and management is a priority. Three aspects were discussed:

1. Water use component, with an improvement of water management at the territorial planning level, in consultation with the DATAR (Interministerial Delegation for spatial planning and regional attractiveness)
2. Agricultural component, especially at the quantitative level regarding the deficit problems during dry periods.



3. Ecosystem and environmental components, with public bodies (Etablissement Publique Territorial de Bassins) and river agencies, through territorial contracts.

A better water management inside the major water cycle was also addressed. It would be expected to improve knowledge about the state of water quality, with more robust data and better modelling of climate change impacts, in order to establish appropriate directives and strategies.

The topic of interest for the region in the context of innovation in wastewater treatment is related to health services and aquatic environments. It involves both a better understanding of the impacts of endocrine-disrupting molecules used in medicine and naturally occurring molecules (hormones) on habitats and the search for a treatment system for these molecules. It is mandatory to improve the knowledge about the reactivity of these molecules, their reactivity and persistence in the environment and to develop innovative treatment solutions to isolate them. Those solutions shall be implemented in urban effluents, hospital effluents, EHPAD (homes for elderly people) and livestock.



3. Identification of opportunities and synergies

3.1 Strategic areas identified in each one of the different regions

The strategic areas (specialization/emergent areas) for each region were initially retrieved from the RIS3 report of each region. This information was adjusted during the meetings held with the administrative institutions and actors, and a list of strategic areas in each region is presented in table 3.1.

Table 3.1- Specialization and emergent areas of RIS3 identified in each region

Country	Region	Specialization and emergent areas
Portugal	Lisbon	Research, technologies and health services; Knowledge, prospection and valorization of sea and marine resources; Tourism and hospitality; Mobility and transports; Creative media and cultural industries; Transversal priorities domain (advanced services provided to local enterprises).
	Alentejo	Food and forestry; Critical technologies, energy and intelligent mobility; Economy of natural, environmental and mineral resources; Heritage, cultural and creative industry and tourism. Technologies and specialized services of social economy.
Spain	Andalusia	Agro-food and agrarian sector; Mining; Health and quality;

		<p>Aerospace and aeronautics;</p> <p>Renewable energy;</p> <p>Environmental industries and services;</p> <p>Habitat;</p> <p>Tourism and leisure;</p> <p>Culture and creativity.</p>
	Murcia	<p>Agricultural and food sector;</p> <p>Environment and water cycle;</p> <p>Tourism;</p> <p>Maritime and marine sector;</p> <p>Energy.</p>
France	Nouvelle Aquitaine	<p>Drones and robotics;</p> <p>Health services;</p> <p>Cosmetics;</p> <p>Silver economy;</p> <p>Tourism.</p>
	Occitanie	<p>Energy transition;</p> <p>Water, wastewater and integrated water resources management;</p> <p>Coastal and marine economics;</p> <p>Medicine and health for the future;</p> <p>Aeronautics and advanced industries;</p> <p>Agri-food production;</p> <p>Smart systems.</p>

It is clear that all the regions share more than one emergent or specialization area.



3.2 Opportunities available by region

From the different meetings attended during the project, it was possible to define opportunities for each region inside the water sector. These several opportunities are presented in table 3.3, related to the respective specialization area where they are inserted.

Table 3.2- Water sector opportunities in Portugal.

Country	Region	Specialization or emergent areas	Opportunities
Portugal	Lisbon	Knowledge, prospection and valorization of sea and marine resources	Protection of coastal and estuarine waters from microplastics and other recently found pollutants.
		Transversal priorities domain	Help local industries and enterprises saving water on their activities, aiming to decrease water bills. Treated wastewater (reclaimed water) should be regarded as an alternative water source.
	Alentejo	Food and Forestry	Evaluation of water needs; Impact of climate changes on precipitation; Protection from water bodies from pollution. Tourism associated with water bodies; Potential of irrigation with reclaimed water.



Table 3.3 - Water sector opportunities identified in Spain.

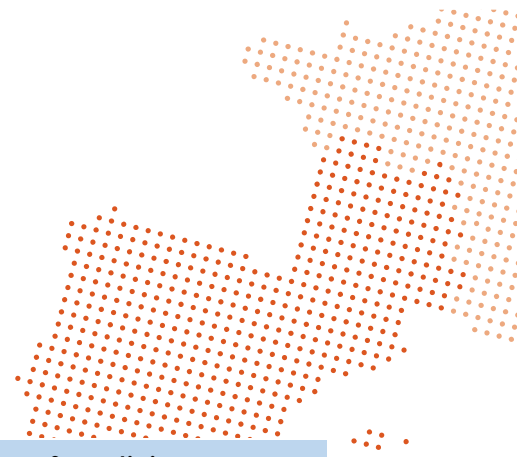
Country	Region	Specialization emergent areas	or	Opportunities
Spain	Andalusia	Agro-food and agrarian sector		Optimization of irrigation and fertilization, improvement of facilities and application of tools to improve management. Improve the knowledge and performance of the intensive irrigation systems.
		Mining		Sustainable exploitation and the necessary restoration processes of wastewaters from mining activities.
		Environmental industries and services		Resources management and environmental recovery; Integral water management; Development of technologies and new processes for water treatment; Ecosystem water management; Water quality as the development and improvement of water sampling techniques.
	Murcia	Agricultural and food sector		Updating of means of production (international leader and possibility of increasing the export share in greenhouse material, hydroponics and localized irrigation, technology.



		Environment and water cycle	Smart cities (convergence of energy, transport, water, environment and ICT's sectors in the urban context); Increasing need of water management; New bio depollution and purification methods.
		Maritime and marine sector	Protection of the marine environment; New water technologies: desalination.

Table 3.4 - Water sector opportunities identified in France.

France	Nouvelle Aquitaine	Drones and robotics	Detection of pollution release and its impacts on the environment; Use of robotics and artificial intelligence on water and wastewater industry.
		Health	Limit the negative impact of wastewater on environment and through the trophic chain; Assessment of climate changes and their impact on the proliferation of mosquitos carrying diseases.
		Cosmetics	Limit the wastewater production of this industry; Favor water recycling.
		Silver economy	Treatment of wastewater from EHPAD, specific problem due to



			high amount of medicines.
		Tourism	Water quality for leisure and recreative activities. Work with the hotel industry to promote water savings.
	Occitanie	Water, wastewater and integrated water resources management	Identification and exploration of complex reservoirs; Concerted management of reservoir exploitation; Intelligent water supply networks; Waters dedicated to food and non-food production; Sanitation with valorization of materials and treated water.
		Coastal and marine economics	Sustainable measures of coastal development.
		Agri-food production	Develop tomorrow's agriculture to face the impacts of climate change. Sustainable agriculture preserving the water resources.
		Smart systems	Use of new technologies to increase the efficiency of water supply and wastewater treatment infrastructures.



3.3 Synergies between regions

The previous tables (3.3, 3.4, 3.5 and 3.6) presented two common areas of interest between the three countries: the **protection of coastal areas and marine resources** (Lisbon, Murcia and Occitanie) and the development of a **sustainable and efficient agri-food sector** (Alentejo, Andalusia, Murcia and Occitanie).

Andalusia, Murcia and Occitanie are global leaders on agri-food sector, intended to increase the efficiency of their already developed and productive agrarian sector, without compromising a sustainable future. Alentejo can benefit from their knowledge and sustainable innovation programs, expanding the development of its agrarian sector with privileged methods and tools and avoiding some errors from their past experiences.

It is also relevant to mention that all the countries are concerned about the impact of **climate changes**. From this point of view, reuse of treated wastewater as an alternative water source to reduce the pressure of existing freshwater resources, can be a relevant solution to explore.

The preservation of coastal and marine resources can take advantage of the best areas in each region. As an example, Lisbon area is presented as the hotspot of R&D agencies in Portugal, mobilizing top researchers and research units. Andalusia and Murcia are investing on new water technologies, regarding not only efficient and integrated management strategies on water sector and new sampling techniques to detect the new **micropollutants** (microplastics, medicines and others), but also developing the concept of **smart cities**. Hence, Lisbon, Andalusia and Murcia have a strong knowledge base in these topics (and can search for opportunities to capitalize it into new products by exploring the state-of-the-art aeronautics, robotics, artificial intelligence and other **new technologies** industries established in Nouvelle Aquitaine and Occitanie regions.

The three countries also share a strong investment on **tourism and leisure**, being this sector an important part of their economies. Once again, it is important to preserve the quality of recreative water bodies, an objective that is directly linked to the investment on new water technologies.



4. Final recommendations and conclusions

The identified interregional synergies revealed a strong relation between Portugal, Spain and France laying in three principal aspects: Portugal is the country who needs to grow and develop their raw opportunities. Spain, alongside with France, has the proven experience on these sectors and the precious know-how from past experiences. France, on other hand, has the leading technology. Between the three countries it is imperative to build a common learning network to develop the water sector, the water sector economy and to ensure a sustainable and green future.

