



AQUAMAN

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# AQUAMAN PROJECT

Smart Water Solutions for Sustainable Tourism in Mediterranean Islands and Coasts



Shaping the future of water-smart tourism: a policy roadmap for climate-resilient coastal destinations & islands

## Conclusions and recommendations from the Interreg Euro-MED

AQUAMAN Project Water Scarcity Living Labs

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## Contents

|                                                                                                                                           |    |
|-------------------------------------------------------------------------------------------------------------------------------------------|----|
| Introduction .....                                                                                                                        | 4  |
| 2. Aligning AQUAMAN with European priorities .....                                                                                        | 6  |
| 2.1 Supporting the Future Pact for the Mediterranean .....                                                                                | 6  |
| 2.2 Contributing to the European Sustainable Tourism Agenda .....                                                                         | 6  |
| 2.3 Advancing climate-resilient coastal destinations and islands .....                                                                    | 7  |
| 2.4 Delivering on the European Green Deal and the circular economy .....                                                                  | 7  |
| 2.5 Contributing to the SDGs (Sustainable Development Goals).....                                                                         | 8  |
| .....                                                                                                                                     | 9  |
| 2.6 Mediterranean transformation .....                                                                                                    | 9  |
| 3. Shared lessons from the seven Water Scarcity Living Labs.....                                                                          | 10 |
| 3.1 Water as a strategic resource for tourism resilience.....                                                                             | 10 |
| 3.2 Combining innovation with Mediterranean water heritage .....                                                                          | 11 |
| 3.3 Governance and cooperation are as relevant as technology .....                                                                        | 11 |
| 3.4 Citizens and tourism businesses must become active partners.....                                                                      | 12 |
| 4. Seven Water Scarcity Living Labs, seven ways to apply solutions .....                                                                  | 13 |
| 4.1 Porquerolles (France): Restoring natural water cycles in a protected island environment<br>(23 september, 2025) .....                 | 13 |
| 4.2 Halki (Greece): Building water autonomy through circular innovation and community<br>engagement (13 November, 2025) .....             | 14 |
| 4.3 Ponza (Italy): Recovering traditional water systems for future resilience (26 March, 2026)<br>.....                                   | 15 |
| 4.4 Seville, Andalusia (Spain): Strengthening governance for urban and water resilience in<br>Andalusian coasts (25 February, 2026) ..... | 16 |
| 4.5 Faro, Algarve (Portugal): Mobilising the tourism sector (9 April, 2026) .....                                                         | 17 |
| 4.6 Gozo (Malta): Integrating water circularity with cultural heritage (10 April, 2026) .....                                             | 18 |
| 4.7 Tenerife, Canary Islands (Spain): Integrating the water cycle through governance finance<br>and information (14 July, 2026) .....     | 19 |
| 5. Strategic recommendations .....                                                                                                        | 20 |
| 5.1 Accelerate the adoption of non-conventional water resources .....                                                                     | 20 |



|                                                                                  |    |
|----------------------------------------------------------------------------------|----|
| 5.2 Combine innovation with traditional Mediterranean knowledge.....             | 21 |
| 5.3 Strengthen integrated governance.....                                        | 21 |
| 5.4 Support tourism SMEs in the green transition .....                           | 21 |
| 5.5 Promote a culture of water stewardship .....                                 | 21 |
| 5.6 Strengthen Mediterranean cooperation .....                                   | 22 |
| 5.7 Monitor progress through shared indicators .....                             | 22 |
| 6. The contribution from local initiatives .....                                 | 22 |
| 7. Looking ahead: Building the next generation of water-smart destinations ..... | 23 |
| 8. Final reflections: A shared responsibility for the Mediterranean .....        | 24 |





## Introduction

Water scarcity is becoming a major challenge for the future of tourism in the Mediterranean. Rising temperatures, prolonged periods of drought, increasing competition for water resources and the concentration of visitors during the peak tourist season are putting growing pressure on coastal and island destinations. At the same time, these territories depend strongly on tourism for their local economies and social well-being and are particularly exposed to the effects of climate change.

For this reason, ensuring a reliable and sustainable water supply is becoming a key issue for Mediterranean destinations. It is not only an environmental concern, but also an important factor for maintaining their competitiveness, resilience and attractiveness in the long term. Addressing this challenge requires a broader approach to water management, combining technological solutions with ecosystem-based measures, better governance and the involvement of the different stakeholders concerned.



Locations of the seven AQUAMAN Water Scarcity Living Labs

The **Interreg Euro-MED AQUAMAN Project** was set up to explore how non-conventional water resources and innovative water management practices can help address water scarcity in coastal and island tourism destinations. Through the **Blue Horizons Catalogue**, the project has identified transferable solutions aimed at improving water efficiency, promoting circularity and strengthening climate resilience, while taking into account the different conditions of Mediterranean territories.

A central part of the project has been the organization of seven **Water Scarcity Living Labs** in different Mediterranean destinations:

- **Porquerolles (France)**
- **Halki (Greece)**



- **Ponza (Italy)**
- **Seville, Andalusia (Spain)**
- **Faro, Algarve (Portugal)**
- **Gozo (Malta)**
- **Tenerife (Spain)**

The Living Labs were designed as spaces for discussion and exchange rather than focusing only on technical solutions. Public authorities, tourism businesses, water utilities, researchers, training organizations, environmental organizations and local communities discussed their local water challenges, considered possible solutions and explored ways to improve water management in their territories.

Although the seven destinations have different geographical, climatic and socio-economic conditions, the discussions identified a number of common priorities. Stakeholders agreed that improving water resilience requires not only technological solutions, but also better governance, stronger cooperation, greater public awareness and a continued use of traditional Mediterranean knowledge and practices related to water management.

This report brings together the main conclusions and recommendations from the seven Living Labs. It presents the common challenges identified, the lessons learned and a number of approaches that could be adapted and applied in other Mediterranean destinations.

The report aims to provide a practical basis for supporting the transition towards more water-efficient, climate-resilient and sustainable tourism, while protecting water resources and supporting the long-term well-being of local communities.



AQUAMAN *Blue Horizons* Catalogue, identifying transferable solutions to improve water efficiency.



## 2. Aligning AQUAMAN with European priorities

The challenges identified through the AQUAMAN Water Scarcity Living Labs extend well beyond local water management. They reflect many of the strategic priorities currently shaping European policies for climate adaptation, sustainable tourism, environmental protection and Mediterranean cooperation. As such, the recommendations emerging from the project contribute directly to the implementation of several major European policy frameworks.

### 2.1 Supporting the Future Pact for the Mediterranean

The recently proposed **Future Pact for the Mediterranean** calls for a renewed partnership among Mediterranean countries based on resilience, sustainable economic



development and stronger regional cooperation. Water security is recognized as a cornerstone for achieving these ambitions, particularly in coastal and island territories where climate change is already affecting daily life, economic activity and ecosystem health.

The AQUAMAN Water Scarcity Living Labs demonstrate how local cooperation can translate these strategic objectives into practical action. By bringing together municipalities, tourism businesses, researchers, civil society organizations and water authorities, the project promotes integrated decision-making and reinforces the collaborative governance model encouraged by the Pact. The experiences gathered in Ponza, Halki, Porquerolles, Andalusia, Algarve, Gozo and Tenerife show that knowledge exchange between

Mediterranean territories can accelerate the adoption of innovative yet locally adapted solutions.

### 2.2 Contributing to the European Sustainable Tourism Agenda

European tourism policy increasingly recognizes that the competitiveness of destinations depends on their ability to use natural resources responsibly while enhancing the quality of life of local communities. Sustainable tourism is therefore understood not simply as reducing environmental impacts, but as improving resilience, supporting local economies and creating long-term value.

The AQUAMAN Water Scarcity Living Labs fully embrace this approach. Participants consistently highlighted that water efficiency should not be viewed as a constraint for tourism but as an opportunity to improve operational performance, reduce costs, strengthen



destination reputation and respond to the growing expectations of environmentally conscious travellers.

The project also illustrates how sustainability can become a competitive advantage through voluntary certification schemes, behavioural change initiatives, innovative business practices and stronger cooperation between the public and private sectors.

## 2.3 Advancing climate-resilient coastal destinations and islands

Mediterranean islands and coastal destinations are among Europe's climate hotspots. Rising temperatures, prolonged droughts, saline intrusion into aquifers and increasing tourism demand require adaptation strategies that combine infrastructure, nature-based solutions and effective governance.

The Water Scarcity Living Labs consistently demonstrated that resilience cannot rely on a single technological intervention. Instead, successful adaptation depends on combining multiple complementary measures, including:

- diversification of water sources;
- rainwater harvesting and storage;
- water reuse;
- restoration of traditional hydraulic infrastructure;
- smart monitoring technologies;
- ecosystem conservation;
- active stakeholder engagement.



This integrated perspective closely reflects the principles promoted by the European initiative on **Climate-Resilient Coastal Destinations and Islands**, which advocates systemic adaptation strategies capable of addressing environmental, economic and social dimensions simultaneously.

## 2.4 Delivering on the European Green Deal and the circular economy

The European Green Deal promotes a transition towards a resource-efficient, climate-neutral and circular economy. Water plays a fundamental role within this transition, particularly in sectors such as tourism that experience strong seasonal fluctuations in resource demand.



Across all seven Living Labs, participants recognized that conventional linear models of water consumption are no longer adequate. Instead, they emphasized the importance of viewing water as a circular resource that can be captured, reused, stored and managed more efficiently throughout the tourism value chain.

The promotion of non-conventional water resources, the recovery of traditional cisterns, the implementation of greywater reuse systems and the introduction of smart water management technologies all contribute to reducing pressure on freshwater resources while improving the resilience of local economies.



## 2.5 Contributing to the SDGs (Sustainable Development Goals)

The outcomes of the AQUAMAN Water Scarcity Living Labs also support the implementation of the United Nations 2030 Agenda, particularly:

- **SDG 6** – Clean Water and Sanitation, by promoting water efficiency, reuse and integrated resource management.
- **SDG 8** – Decent Work and Economic Growth, by strengthening the resilience and competitiveness of tourism-dependent economies.
- **SDG 11** – Sustainable Cities and Communities, through more resilient planning and improved management of local resources.
- **SDG 12** – Responsible Consumption and Production, by encouraging circular water use and more sustainable tourism practices.
- **SDG 13** – Climate Action, through practical adaptation measures that reduce vulnerability to drought and climate change.
- **SDG 17** – Partnerships for the Goals, by placing multi-stakeholder collaboration at the centre of decision-making.



## 2.6 Mediterranean transformation

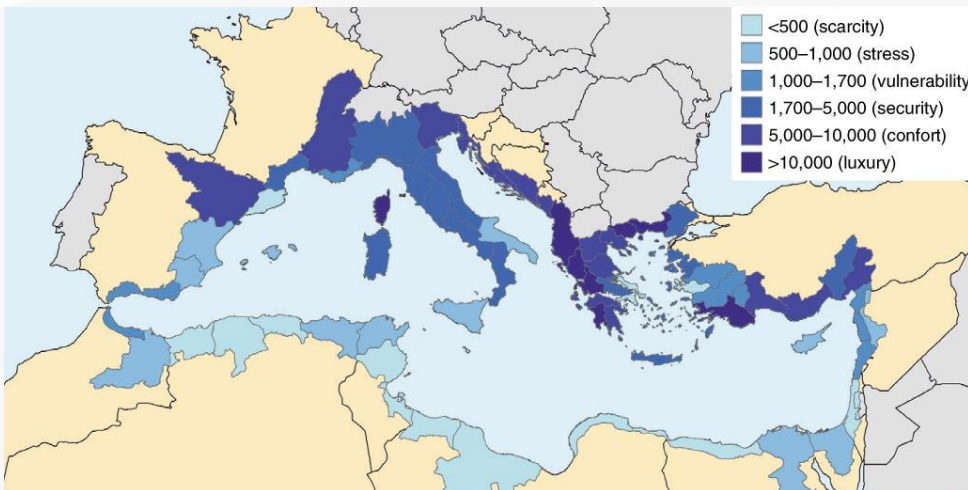
Perhaps the most important contribution of the AQUAMAN Water Scarcity Living Labs lies in demonstrating that European policy objectives become meaningful only when they are translated into local action. While each participating territory faces different environmental conditions and governance contexts, the project has shown that common collaboration, innovation, circularity, stakeholder participation and respect for local knowledge—can guide effective responses across the Mediterranean.

In this sense, AQUAMAN is more than a project focused on water management. It represents a practical example of how European cooperation can support communities in building more resilient tourism destinations while protecting one of the Mediterranean's most valuable and vulnerable resources: water.



### 3. Shared lessons from the seven Water Scarcity Living Labs

The seven AQUAMAN Water Scarcity Living Labs, held across Mediterranean islands and coastal destinations, provided a unique opportunity to compare different territorial realities facing a common challenge: securing sustainable water resources in areas where tourism, climate change and environmental pressures increasingly converge.



Water scarcity and water stress across the Mediterranean region

Although the participating regions differ considerably in terms of geography, governance structures, population size and water infrastructure, the discussions revealed a remarkable consensus. Water scarcity is no longer perceived as an isolated environmental issue but as a strategic factor affecting tourism competitiveness, territorial resilience and

community well-being.

Rather than identifying isolated technical solutions, the Living Labs highlighted the importance of integrated approaches that combine innovation, governance, public participation and the recovery of traditional knowledge. Four overarching lessons emerged consistently across all participating territories.

#### 3.1 Water as a strategic resource for tourism resilience

One of the strongest messages emerging from every Living Lab was the need to redefine the role of water within tourism destinations. Water can no longer be regarded simply as an operational resource supplied on demand. Instead, it must be recognized as a strategic asset whose availability directly influences economic stability, environmental sustainability and social cohesion.

Participants consistently noted that prolonged droughts, increasing visitor numbers and climate uncertainty require destinations to move from reactive crisis management towards long-term resilience planning. This implies anticipating future water demands, diversifying available resources and integrating water considerations into tourism planning, urban development and environmental management.



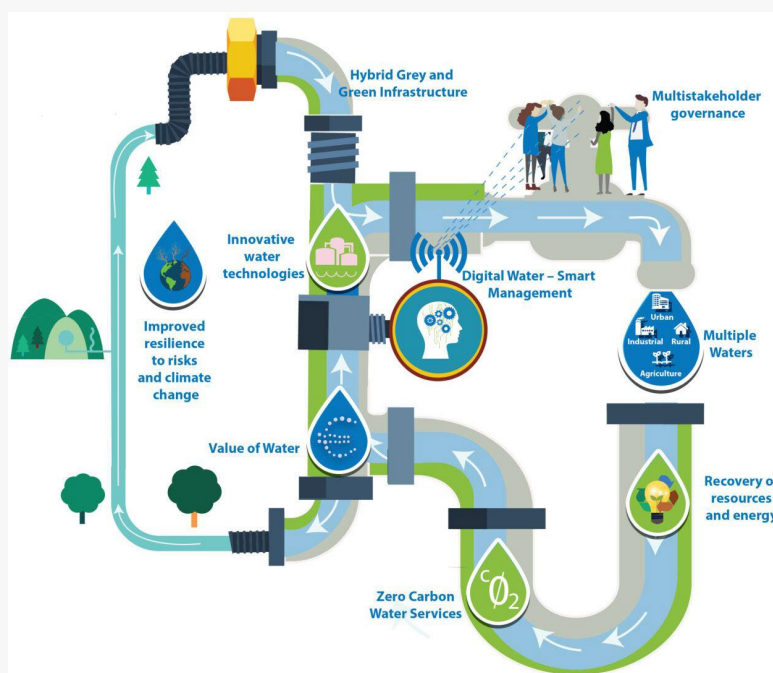
The discussions also highlighted the importance of considering water resilience as an opportunity rather than merely a constraint. Investments in efficient water management can reduce operating costs, strengthen destination reputation and improve the overall visitor experience while protecting local communities and ecosystems.

### 3.2 Combining innovation with Mediterranean water heritage

A second lesson shared across all Living Labs concerns the need to balance technological innovation with traditional Mediterranean knowledge.

Advanced solutions such as smart monitoring systems, digital leak detection, desalination powered by renewable energy and water reuse technologies are increasingly essential for adapting to climate change. However, participants repeatedly stressed that innovation should not replace the region's long-standing experience in managing scarce water resources but rather complement it.

Traditional rainwater harvesting systems, historic cisterns, gravity-fed distribution networks and locally adapted storage practices represent centuries of accumulated knowledge that remain highly relevant today. In several territories these heritage assets are no longer viewed solely as cultural landmarks but as valuable components of modern water management strategies.



Integrated and circular approaches to sustainable water

This combination of innovation and heritage offers Mediterranean destinations an opportunity to develop solutions that are technically effective, economically viable and culturally meaningful.

### 3.3 Governance and cooperation are as relevant as technology

While technological solutions attracted considerable attention throughout the Living Labs, participants repeatedly concluded that governance remains the greatest challenge.

Responsibilities for water management are frequently distributed across multiple institutions with different priorities, including tourism authorities, environmental agencies,



municipalities, water utilities and regional administrations. This fragmentation often delays decision-making, complicates investment planning and reduces the effectiveness of adaptation measures.

The Water Scarcity Living Labs demonstrated the value of collaborative governance models capable of bringing together public authorities, businesses, researchers and civil society around shared objectives. Such cooperation not only improves coordination but also strengthens public confidence, facilitates knowledge exchange and encourages the development of solutions that respond to local needs. They also show that fragmented governance should not automatically be interpreted as an absence of formal authority. In some territories, responsibilities are clearly assigned but distributed across organisations responsible for different stages of the water cycle. The practical constraint then lies in coordinating information, investment and implementation across interdependent services. This distinction matters because creating new authority will not resolve bottlenecks caused by poorly sequenced infrastructure, incompatible data or unequal delivery capacity

Building these collaborative networks may ultimately prove more important than introducing any individual technological innovation.

### 3.4 Citizens and tourism businesses must become active partners

Another recurring conclusion was that achieving water resilience depends on behavioural change as much as on infrastructure.

Many participants observed that water consumption remains largely invisible to visitors, while tourism businesses often underestimate the economic benefits associated with improved water efficiency. Raising awareness, providing practical guidance and creating positive incentives were therefore considered essential components of any long-term strategy.

Rather than relying exclusively on regulatory measures, stakeholders favoured voluntary initiatives such as sustainability certifications, awareness campaigns, staff training programmes and public recognition schemes that encourage continuous improvement.

The Living Labs also emphasized that local communities should not simply be consulted but actively involved in designing and implementing water management strategies. Building a culture of shared responsibility strengthens both environmental outcomes and social acceptance.



## 4. Seven Water Scarcity Living Labs, seven ways to apply solutions

While the Living Labs revealed many shared challenges, each participating territory also contributed valuable experiences reflecting its own environmental conditions, governance structures and tourism model. Together, these local perspectives demonstrate that there is no single solution to Mediterranean water scarcity. Instead, resilience is built through flexible approaches that respond to local realities while sharing common principles.

### 4.1 Porquerolles (France): Restoring natural water cycles in a protected island environment (23 september, 2025)

The Water Scarcity Living Lab in Porquerolles focused on strengthening water resilience within the highly protected environment of the Port-Cros National Park, where increasing climate pressures and seasonal tourism are placing growing demands on limited freshwater resources. Discussions centered on identifying solutions that could enhance water security while remaining fully compatible with the island's exceptional ecological and landscape values.

Participants identified the restoration of natural water cycles as a key priority. Nature-based solutions such as vegetated infiltration areas, swales and runoff retention systems were considered particularly suitable for increasing groundwater recharge, reducing soil erosion and limiting the loss of rainwater to the sea. Alongside these measures, the rehabilitation of traditional wells and historic cisterns emerged as a practical and culturally valuable approach to expanding non-potable water storage while reducing dependence on imported water.



Island of Porquerolles, Provence-Alpes-Côte d'Azur, France.

Photo: Hugo Petitjean

The Living Lab also highlighted the importance of collaborative governance involving the National Park, local authorities, tourism operators, private landowners and residents. Participants recognized that technical solutions alone would not be sufficient without improved regulatory guidance, hydrological knowledge and continued stakeholder cooperation. Together, these actions provide a balanced pathway towards climate-resilient water management that integrates environmental protection, cultural heritage and sustainable tourism development.



## 4.2 Halki (Greece): Buildingwater autonomy through circular innovation and community engagement (13 November, 2025)

The Halki Living Lab, celebrated in Rhodes, identified water security as a major challenge for a small island facing seasonal tourism pressure, limited freshwater resources, ageing infrastructure and complex administrative procedures. The current system relies heavily on desalination, while rainfall is largely lost to the sea and existing resources, including abandoned wells, remain underused. Limited technical capacity, difficulties in securing permanent skilled staff, fragmented responsibilities and insufficient funding further constrain the implementation of alternative solutions, affecting residents, tourism, agriculture and ecosystems, particularly during the summer season.



Port of Halki (Greece). Photo: Christos Ioannides

The Living Lab proposed a transition towards a circular and integrated water management system, reducing dependence on conventional desalination through the diversification of water sources. Key measures include rainwater harvesting and aquifer recharge, the reactivation of old wells, safe water reuse and resource recovery, nature-based solutions and improved infrastructure. Constructed wetlands, identified in the AQUAMAN Transferable Solutions Catalogue as a potential solution for Halki, are particularly relevant. Desalination powered by solar energy could contribute to a more balanced 50:50 supply model

between desalination and alternative resources, while telemetry and smart meters would help detect losses and improve efficiency.

The island's small scale offers opportunities for closer cooperation between local authorities, experts, residents and tourism operators, helping to overcome institutional fragmentation and accelerate implementation. Recommendations include mapping water resources, piloting tailored reuse and nature-based solutions, strengthening local technical capacity and reducing administrative barriers. Education and awareness among residents and visitors should also promote responsible consumption, ensuring lasting behavioural change while supporting ecosystems, agriculture and the retention of younger generations on the island.

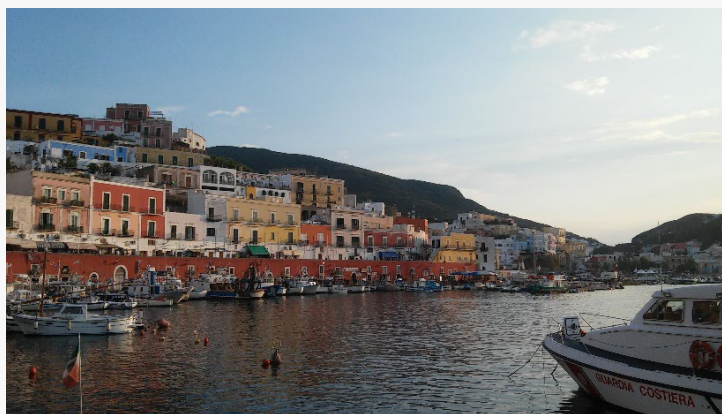


Halki Solar Park. Photo: ChalkiON project



### 4.3 Ponza (Italy): Recovering traditional water systems for future resilience (26 March, 2026)

Ponza provided one of the clearest examples of how traditional infrastructure can guide modern climate adaptation. Historically, the island relied on an extensive network of tuff cisterns to cope with scarce natural water resources. Over time, dependence on water tankers, together with concerns about the potential risks associated with radioactive emissions from volcanic tuff, restricted the use of some traditional cisterns for potable water, increasing vulnerability and costs. Water scarcity is particularly critical during peak tourism periods, when demand increases significantly, while rainwater is not sufficiently collected and local water resources remain underused.



Port of Ponza. Latina (Italy). Photo: pv746

The Living Lab concluded that the solution lies in a hybrid and circular system combining traditional knowledge with modern technologies.

Key measures include restoring and reactivating existing cisterns, while integrating new rainwater harvesting systems, fiberglass storage tanks and technologies for the recovery and reuse of non-potable water. The better use of wells and other local resources, together with larger storage capacity and monitoring of water consumption in tourism facilities, could further strengthen resilience.

These measures are consistent with the AQUAMAN Transferable Solutions Catalogue, particularly rainwater harvesting, water storage, water reuse and awareness-raising measures. Participants also highlighted the need to overcome the assumption that centralised, high-tech solutions are necessarily the most appropriate, and to develop a coordinated circular water management plan involving residents, farmers, public authorities and the tourism sector. Awareness campaigns and guidance for tourism operators were identified as essential to promote responsible water consumption and support a more autonomous, resilient and sustainable island water system.



## 4.4 Seville, Andalusia (Spain): Strengthening governance for urban and water resilience in Andalusian coasts (25 February, 2026)

The Seville Living Lab identified water scarcity as a major climate-related challenge for Andalusian coastal tourism, intensified by prolonged droughts, rising temperatures and strong seasonal peaks in water demand. Tourism activities depend heavily on freshwater resources, contributing to the overexploitation and salinization of coastal aquifers and increasing pressure on ecosystems. Stakeholders also highlighted rising costs, potential inequalities in water access between tourist and local areas, and the limited technical and financial capacity of SMEs and rural tourism operators.

Governance fragmentation between tourism, water, agriculture and environmental authorities was identified as a key barrier to integrated management.



Aerial view of Nerja, Axarquía-Costa del Sol, Málaga (Andalusia)  
Photo: Manolo Franco

The Living Lab proposed a transition towards more circular and diversified water management, with non-conventional resources playing a central role. Solutions selected from the AQUAMAN Blue Horizons Catalogue include greywater recycling for irrigation and cleaning, and the use of reclaimed or desalinated water for landscaping, golf courses and swimming pools. Rainwater harvesting in tourism infrastructures was also considered practical and scalable.



Floating photovoltaic installation in Guaro, Málaga, Spain, by the firm Landatu Solar. Photo: Landatu Solar

Smart digital monitoring systems, capable of tracking consumption and detecting leaks, would further improve efficiency and support evidence-based management.

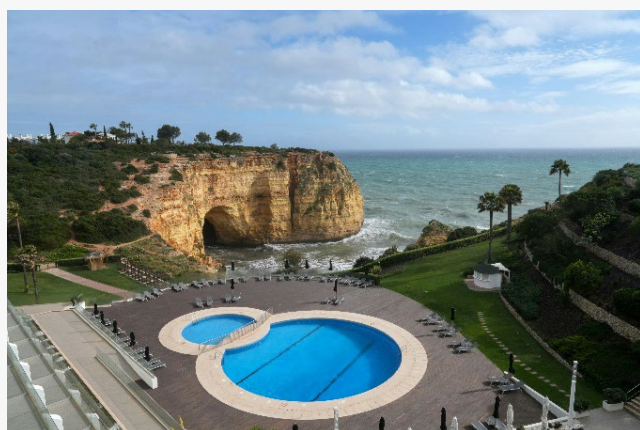
Recommendations focused on strengthening cooperation between public authorities, tourism businesses, water operators, researchers and local communities, while simplifying administrative procedures for reclaimed water use and providing funding and technical assistance. Particular attention should be given to SMEs and rural operators to ensure an equitable transition. Pilot projects, awareness campaigns and water-efficiency certification schemes were also proposed, alongside alignment with the **Andalusian Programme for Water and Energy**



**Efficiency in Tourism.** Progress could be monitored through reductions in potable water consumption, increased reclaimed water use and reduced freshwater extraction from vulnerable aquifers.

## 4.5 Faro, Algarve (Portugal): Mobilising the tourism sector (9 April, 2026)

The Algarve Living Lab highlighted the strong pressure that water scarcity places on tourism and the need to reduce water consumption while maintaining the sector's economic activity and competitiveness. Accommodation, tour operators, golf courses, water parks, events and leisure services, car-rental companies were identified as areas where water efficiency can be significantly improved.



Seafront hotel in Carvoeiro (Algarve, Portugal).

Photo: Frank Nürnberger

The main challenges identified were poor water management, resource waste, insufficient environmental awareness among staff, customers and tourists, inconsistent water-efficiency practices and limited investment in sustainable solutions. Stakeholders stressed the need to involve the entire tourism value chain, including businesses, employees, suppliers, tour operators, public authorities, academia and local communities.

Several solutions from the AQUAMAN Transferable Solutions Catalogue were considered particularly relevant, including wetland construction, rainwater harvesting systems and green roofs, as well as integrated approaches such as tourism-water-agriculture pilot projects, water performance and rating systems, and benchmarking and behavioural incentives in tourist accommodation. Policy measures such as the **Save Water Label** and dedicated funding programmes for water efficiency in tourism were also highlighted.

Key barriers to implementation include initial investment costs, limited capacities of small and medium-sized enterprises, lack of specific training, difficulties with technological integration and insufficient funding. Recommended measures include targeted training and awareness campaigns, investment in smart technologies, water sensors, flow restrictors, water-reuse systems and rainwater harvesting tanks and wastewater treatment systems, together with structured action plans and incentives.



'Save Water' Water Efficiency Seal



The Living Lab concluded that a coordinated public-private approach, involving local authorities, businesses, academia and communities, is essential to safeguard water resources, particularly during peak tourist demand. It also demonstrated the value of Living Labs for co-creation, knowledge transfer and water literacy, with potential for replication in other tourist regions.

## 4.6 Gozo (Malta): Integrating water circularity with cultural heritage (10 April, 2026)

The Gozo Living Lab identified water scarcity as a growing challenge for an island highly dependent on tourism, with increasing pressure on groundwater resources, reduced aquifer recharge due to climate change and extensive runoff that is not sufficiently captured. Over-abstraction, limited metering of boreholes, inadequate rainwater collection infrastructure, unsustainable agricultural practices and weak enforcement further increase pressure on water resources. Stakeholders also highlighted limited data sharing and a cultural tendency to prioritise the economic value of water over its sustainable management.

The Living Lab demonstrated how Gozo's historical reliance on rainwater harvesting can provide a basis for modern climate adaptation, reducing dependence on costly and energy-intensive desalination. Rainwater collection systems were unanimously selected by the four stakeholder groups, while the rehabilitation of Chadwick Lakes, restoration of historic cisterns and circular tourism-water-agriculture pilot plans were also identified as relevant solutions. These measures could increase water availability and storage, reduce runoff and groundwater

abstraction, and preserve Gozo's rural and cultural landscape.



Various views of the Chadwick Lakes, Malta

The AQUAMAN Catalogue solutions selected also included AQUA+ building certification and grants supporting water reuse and efficiency in tourism businesses. These voluntary, incentive-based measures were considered useful for overcoming financial constraints and encouraging sustainable practices without relying exclusively on stricter regulation.

Recommendations include targeted educational campaigns, stronger public-private cooperation, financial incentives and continued promotion of tested solutions. Overall, Gozo highlighted that circular water management is not only a technical

challenge but also requires cultural and behavioural change, particularly within the tourism sector, to promote shared responsibility for water resources.

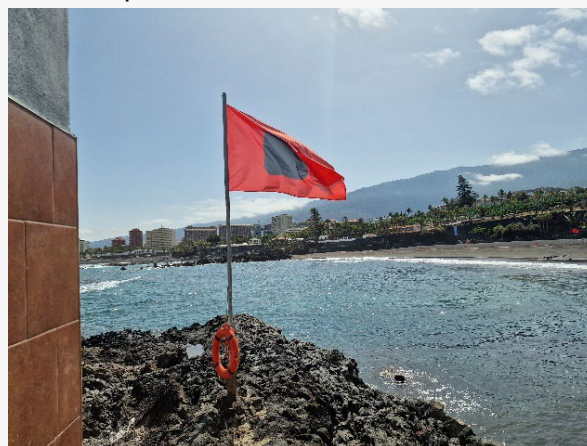


## 4.7 Tenerife, Canary Islands (Spain): Integrating the water cycle through governance finance and information (14 July, 2026)

Tenerife's Living Lab framed water scarcity as a system-wide challenge, not simply a supply shortage. The island faces ageing infrastructure, distribution losses, pressure on groundwater, energy-intensive desalination, incomplete wastewater collection and treatment, and untreated discharges affecting coastal ecosystems. Water security matters to residents, agriculture and tourism, while capacity varies across municipalities and service areas.

The Living Lab envisages transition from an energy-intensive, partially linear model towards a cost-efficient, circular, resilient and traceable water system. Priorities include reducing leakage and avoidable production, completing wastewater collection and treatment, safely reusing reclaimed water, strengthening storage and distribution, integrating renewable energy where appropriate, and using monitoring and digitalisation to reveal flows, losses, demand and bottlenecks. Digital tools support public/private decisions, investment prioritisation and accountability.

Participants highlighted that authority already exists but is distributed among organisations responsible for different stages of



Tenerife beach closed with a red flag due to fecal wastes



Traditional water gallery in Güímar, Tenerife

the water cycle. The central governance challenge is therefore coordinating interdependent responsibilities, information and implementation capacity. Improvements in one stage may have limited benefits when adjacent stages do not progress together—for example, when treatment or regeneration capacity is disconnected from storage, distribution, suitable water quality or stable demand. The Tenerife case therefore points to planning reuse and other non-conventional resources as complete service chains rather than isolated infrastructure projects.

Financing and tariff design are part of this transition. High capital requirements, unequal municipal capacity and the need for skilled personnel call for coordinated investment, European funding, targeted capacity building and financially sustainable services. Fair tariff frameworks should support efficient use and long-term water security while recognising distributional effects across residents and economic



sectors. Demonstration projects and transparent information can build confidence in reclaimed water and clarify the costs and benefits of alternative interventions.

Tenerife's transferable lesson is that water resilience depends on system integration. Infrastructure, digital information, governance, financing and demand must align across collection, treatment, regeneration, storage, distribution and use. This shifts the policy question from selecting individual technologies to identifying and removing bottlenecks that prevent the water cycle from delivering secure, circular and environmentally sound services.

## 5. Strategic recommendations

The experiences gathered through the seven AQUAMAN Water Scarcity Living Labs demonstrate that addressing water scarcity requires more than isolated technological interventions. Building climate-resilient tourism destinations demands integrated policies that combine innovation, governance, investment, education and community participation. Based on the shared conclusions of the Living Labs, seven strategic recommendations are proposed to support Mediterranean destinations in their transition towards more sustainable and resilient water management.

### 5.1 Accelerate the adoption of non-conventional water resources

Mediterranean destinations should diversify their water supply by expanding the use of non-conventional resources, including rainwater harvesting, reclaimed water, greywater reuse and renewable energy-powered desalination where appropriate.

These solutions should complement rather than replace conventional water infrastructure, reducing pressure on freshwater resources while increasing resilience during periods of drought and peak tourism demand.

Non-conventional resources should be planned as complete service chains. Reclaimed water, for example, can contribute to water security only when wastewater collection, treatment, quality assurance, storage, distribution and stable final demand are developed coherently. Investment appraisal should therefore identify the binding system bottleneck and consider avoided environmental damage, energy use and pressure on conventional sources, rather than assessing production capacity in isolation.



## 5.2 Combine innovation with traditional Mediterranean knowledge



The Victory Square Reservoir filled up with rainwater. Malta

The Water Scarcity Living Labs consistently demonstrated that many traditional water management practices remain highly relevant today. Historic cisterns, rainwater storage systems and local hydraulic heritage should be restored and integrated into modern water strategies whenever feasible.

Combining cultural heritage with innovative technologies creates solutions that are environmentally effective, economically viable and closely connected to local identity.

## 5.3 Strengthen integrated governance

Water management requires coordinated decision-making across multiple sectors, including tourism, environmental protection, spatial planning, agriculture and public utilities.

Regional and local authorities should establish permanent coordination mechanisms that facilitate information sharing, joint planning and collaborative implementation of water resilience strategies. Living Labs have shown that successful adaptation depends as much on institutional cooperation as on technological investment.

## 5.4 Support tourism SMEs in the green transition

Small and medium-sized enterprises represent the backbone of Mediterranean tourism but often face financial and technical barriers to implementing water-efficient solutions.

Public support should therefore include simplified funding schemes, technical assistance, demonstration projects and incentives linked to sustainability certification. Helping SMEs adopt innovative practices will accelerate the wider transition towards water-smart destinations.

## 5.5 Promote a culture of water stewardship

Infrastructure alone cannot guarantee long-term resilience. Behavioural change among residents, visitors and tourism professionals is equally important.

Awareness campaigns, training programmes, educational initiatives and voluntary certification schemes should encourage responsible water use while demonstrating the environmental and economic benefits of water efficiency.



## 5.6 Strengthen Mediterranean cooperation

Many Mediterranean territories face similar challenges despite their different geographical and administrative contexts.

Cross-border cooperation, peer learning and the exchange of practical experiences should continue beyond the lifetime of individual projects. Networks of destinations can accelerate innovation, reduce duplication of efforts and support the transfer of successful solutions across the region.

## 5.7 Monitor progress through shared indicators

To ensure continuous improvement, water resilience strategies should be accompanied by common monitoring frameworks capable of measuring progress over time.

Indicators related to water efficiency, reuse, stakeholder participation, ecosystem protection and tourism performance will help destinations evaluate the effectiveness of their actions and adapt policies where necessary.

Monitoring systems should support decisions rather than operate as stand-alone digital solutions. A common indicator framework should make visible where water is produced, lost, treated, stored and used; the energy and financial costs of each stage; service and quality inequalities; and the utilisation of existing capacity. These indicators can strengthen accountability and help prioritise investment, tariff reform and technical assistance.

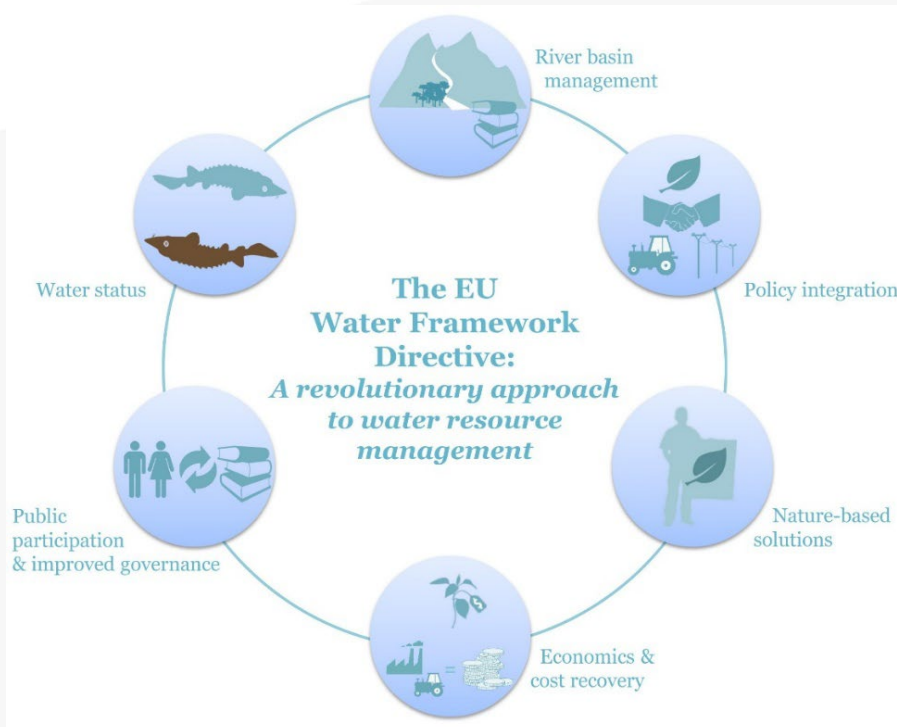
# 6. The contribution from local initiatives

The AQUAMAN Water Scarcity Living Labs show how local action can contribute to wider European priorities. While each participating territory has approached water scarcity from its own environmental, economic and social perspective, the discussions and solutions developed through the Living Labs point in a similar direction to current European priorities on climate adaptation, sustainable tourism and the efficient use of resources.

The recommendations developed through the project are in line with the approach promoted by the **Future Pact for the Mediterranean**, particularly its focus on cooperation, resilience and sustainable development. The Living Labs have brought together public authorities, tourism businesses, researchers and local communities, showing the importance of involving different stakeholders when addressing complex challenges such as water scarcity.



AQUAMAN also supports the objectives of the **European Sustainable Tourism Strategy**. The Living Labs have highlighted the need for tourism to make more efficient use of water and other natural resources, while maintaining the quality and competitiveness of destinations. From this perspective, improving water efficiency should not only be seen as a requirement for tourism businesses. It can also help reduce costs, improve resource management and respond to growing demand for more sustainable tourism.



The solutions identified in the Living Labs are also consistent with the principles behind the European initiative on **Climate-Resilient Coastal Destinations and Islands**. The experiences gathered through AQUAMAN show that adaptation works best when different measures are considered together, combining technical solutions with better management of water resources, ecosystem protection and the involvement of local stakeholders.

The project is also connected to the wider objectives of the **European Green Deal** and the **Circular Economy Action Plan**, particularly through the promotion of resource efficiency, water reuse and more circular approaches to water management. These issues are especially relevant in Mediterranean territories, where freshwater resources are under increasing pressure.

Overall, the AQUAMAN experience shows the importance of connecting European policy with the realities of individual territories. The Water Scarcity Living Labs have provided a practical way to test ideas, share experiences and identify solutions that can be adapted to local circumstances. In this sense, they offer a useful example of how cooperation and local action can help turn European priorities into concrete measures on the ground.

## 7. Looking ahead: Building the next generation of water-smart destinations

Climate change is expected to intensify water stress across the Mediterranean over the coming decades, making adaptation an increasingly urgent priority for tourism destinations.



The experience of the AQUAMAN Water Scarcity Living Labs suggests that future resilience will depend on combining technological progress with stronger governance, informed communities and a long-term vision of sustainable territorial development.

Digital technologies, including smart sensors, real-time monitoring and predictive data analysis, will play an increasingly significant role in improving water efficiency and supporting



evidence-based decision-making.

However, technology alone will not solve the challenges ahead. Equal attention must be given to institutional cooperation, public participation and the protection of natural ecosystems that sustain water resources.

Tourism itself is also evolving. Visitors increasingly value destinations that

demonstrate genuine environmental responsibility and transparent sustainability practices. Water stewardship is therefore becoming a crucial element of destination quality, competitiveness and reputation.

The Living Labs further illustrate that resilience should not simply focus on reducing vulnerability to drought but on creating destinations capable of adapting continuously to changing environmental, social and economic conditions. This requires flexible planning, continuous learning and the capacity to transfer successful experiences between regions.

The Mediterranean possesses a unique combination of cultural heritage, environmental diversity and long-standing traditions of water management. By combining this heritage with innovation and European cooperation, the region has the opportunity to become an international reference for climate-resilient tourism.

## 8. Final reflections: A shared responsibility for the Mediterranean

The seven AQUAMAN Water Scarcity Living Labs have shown that water resilience is not only an environmental issue. It is closely linked to the future of tourism, local economies, cultural heritage and the quality of life of Mediterranean communities.

Although each territory faces different circumstances, the Living Labs identified a number of common challenges and priorities. Sustainable water management requires a



combination of innovation and local knowledge, better cooperation between public and private stakeholders, greater involvement of local communities and a stronger recognition of water as a strategic resource for the future.

The experiences from Porquerolles, Halki, Ponza, Andalusia, Algarve, Gozo and Tenerife also confirm that there is no single solution to water scarcity. Each territory needs to develop responses that reflect its own environmental, economic and social context. At the same time, the different experiences show that these solutions can be supported by shared principles: sustainability, participation, cooperation and the responsible use of water resources.

One of the main lessons from AQUAMAN is the value of the Living Lab approach itself. The Living Labs have created spaces where stakeholders could discuss their concerns, exchange experiences and identify possible solutions together. This has helped bring different perspectives together and, in several cases, has strengthened cooperation between actors who do not always work closely with each other.

Looking ahead, moving towards more water-smart tourism will require continued commitment from public authorities, businesses, communities and other stakeholders. It will also require investment, cooperation and the willingness to build on the knowledge and solutions developed through AQUAMAN.

The experiences collected in this report provide a useful basis for continuing this work beyond the project. Water scarcity will remain a major challenge for Mediterranean destinations, particularly as climate pressures increase. Addressing it effectively will depend on our ability to work together and turn shared knowledge into practical action.

Protecting water means protecting the future of Mediterranean tourism and the communities that depend on it. The experience of AQUAMAN shows that by working together and adapting solutions to local needs, Mediterranean territories can become more resilient while preserving the natural and cultural heritage that makes them unique.

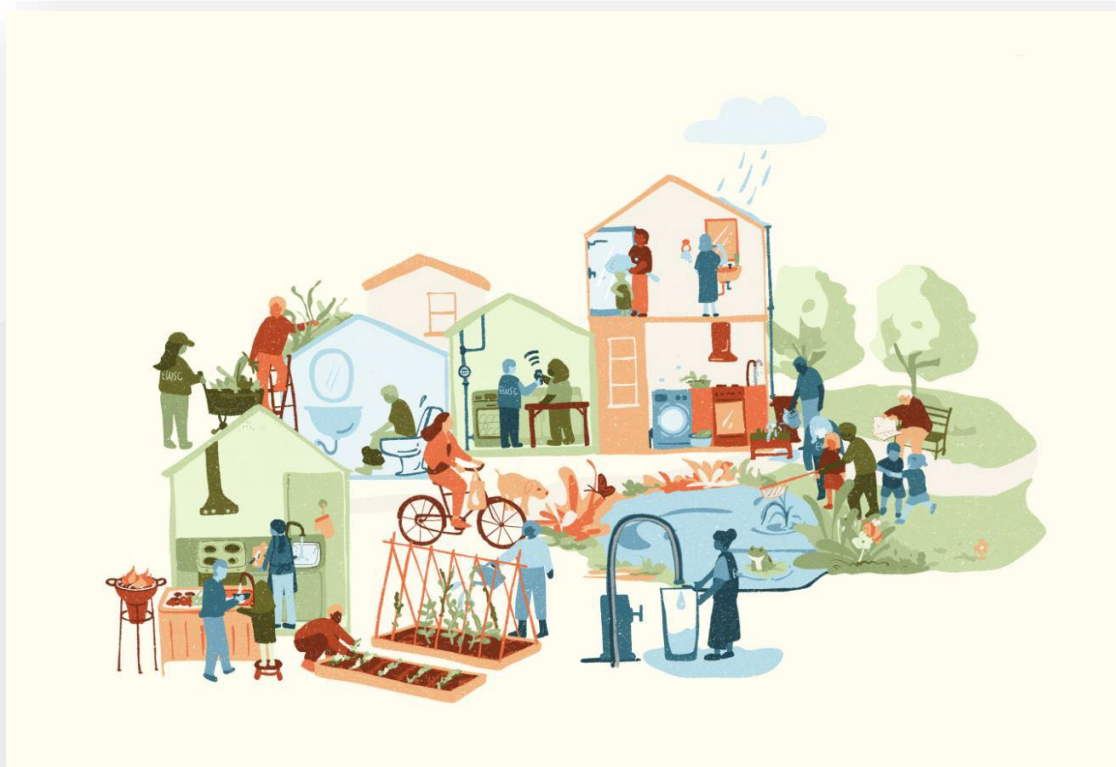


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# AQUAMAN PROJECT

Smart Water Solutions for Sustainable Tourism  
in Mediterranean Islands and Coasts



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