

T1 – WATER SCARCITY & NON-CONVENTIONAL WATER RESOURCES

1. BACKGROUND

Water scarcity has become one of the defining development and environmental challenges of the twenty-first century. Across the world, growing populations, rapid urbanization, changing consumption patterns, and increasing climate variability are placing unprecedented pressure on freshwater resources. The impacts are particularly severe in regions already facing structural water deficits, where competition among agriculture, industry, energy production, ecosystems, and domestic users continues to intensify.

According to international assessments, water demand is projected to rise significantly over the coming decades, while climate change is expected to reduce the reliability of conventional water sources in many vulnerable regions. Global water demand is projected to increase by approximately 20–30% by 2050, driven by population growth, urbanization, industrial development, and rising living standards. At the same time, nearly half of the world's population already experiences severe water scarcity during at least part of the year.

The Mediterranean basin is widely recognized as one of the world's most prominent climate change hotspots. More than 180 million people in the Mediterranean region are estimated to live under conditions of water poverty, and several countries already withdraw over 80% of their available renewable freshwater resources annually, a threshold commonly associated with severe water stress.

The region hosts around 7% of the global population but possesses only about 3% of the world's renewable freshwater resources. Climate projections indicate temperature increases exceeding the global average and reductions in precipitation of up to 20–30% in several southern Mediterranean areas by mid-century. Rising temperatures, declining and increasingly erratic rainfall, prolonged droughts, and more frequent extreme weather events are already affecting water availability and quality throughout the region.

While countries in the Maghreb and Mashreq face some of the highest levels of water stress globally, several Balkan countries are experiencing increasing variability in water resources, with growing consequences for agricultural production, energy systems, ecosystems, and local livelihoods. In many areas, excessive groundwater abstraction, aquifer depletion, salinization, and ecosystem degradation are further reducing the resilience of water systems.

Equally important is the need to improve the management of available water resources. Across the Mediterranean region, significant volumes of water are still lost through inefficient

distribution systems, inadequate irrigation practices, and limited adoption of water-saving technologies. Given that agriculture remains the largest water-consuming sector in most countries, improving water-use efficiency, increasing water productivity, and enhancing the performance and modernization of irrigation systems represent some of the most immediate and cost-effective opportunities to reduce water stress while maintaining food production and rural livelihoods.

Agriculture accounts for approximately 70–80% of total freshwater withdrawals across much of the Mediterranean region, exceeding 85% in several countries of the Maghreb and Mashreq. In some irrigation systems, conveyance and distribution losses can still exceed 30–40% of supplied water. These trends underscore the urgent need to move beyond traditional approaches centred exclusively on surface and groundwater withdrawals.

From Water Scarcity to Water System Transformation

The challenge facing Mediterranean countries is no longer simply to develop additional water supplies. It is to redesign water systems for an era of structural water scarcity. Non-conventional water resources — including reclaimed water reuse, drainage water reuse, renewable-energy-powered desalination, rainwater harvesting, managed aquifer recharge, industrial water recycling, and nature-based solutions — should no longer be viewed as emergency alternatives. They are becoming strategic components of long-term water security.

The emerging objective is therefore to develop a resilient Water Mix, combining conventional and non-conventional resources, demand management, efficiency improvements, and ecosystem protection within an integrated planning framework. The question is no longer whether to use non-conventional water resources, but how to deploy them strategically and integrate them into sustainable, economically viable, and climate-resilient water systems.

The transition to circular water management can simultaneously strengthen climate resilience, support sustainable economic growth, reduce pressure on ecosystems, and create opportunities for innovation and regional cooperation. Given the shared challenges faced across the Mediterranean, strengthening collaboration among the Maghreb, Mashreq, and Balkans has become both a political necessity and an operational priority.

2. KEY CHALLENGES AND OBJECTIVES

A High-Level Panel of Experts will explore how Mediterranean countries can accelerate the transition towards resilient water systems by combining four complementary approaches:

- improving the efficiency and productivity of existing water use;
- protecting and restoring natural water capital;
- strategically deploying non-conventional water resources; and
- strengthening integrated and adaptive water governance.

The discussion will focus on the policy, financial, technological, and societal conditions required to build resilient water systems capable of operating under conditions of structural water scarcity while supporting climate adaptation, food security, economic development, and environmental sustainability.

Challenge 1: Governing Water Scarcity in a Changing Climate

Water stress is no longer a temporary or localized phenomenon, but a structural challenge amplified by climate change. Many countries continue to face fragmented governance arrangements and insufficient coordination among water, agriculture, energy, climate, and urban development sectors.

Challenge 2: Improving Water Use Efficiency and Productivity

The most sustainable source of additional water is often the water that is already available but used inefficiently. Significant opportunities exist to reduce losses, improve irrigation performance, modernize infrastructure, and increase water productivity across agricultural, industrial, and urban sectors.

Challenge 3: Strategic Deployment of Non-Conventional Water Resources

While technologies for water reuse, desalination, managed aquifer recharge, and water recycling are increasingly mature, the challenge is no longer technological feasibility. It is determining how these resources can be integrated into national water systems based on fit-for-purpose allocation, economic viability, energy requirements, environmental sustainability, and long-term resilience objectives.

Challenge 4: Scaling Up Investment and Innovation

Accelerating the transition towards resilient water systems requires regulatory clarity, innovative financing mechanisms, public-private partnerships, and increased investment in both conventional and non-conventional infrastructure.

Challenge 5: Building Public Trust and Social Acceptance

Technical solutions alone are insufficient if communities, farmers, industries, and consumers remain reluctant to embrace water reuse and other innovative practices. Concerns regarding water quality, safety, and public health continue to limit adoption in many countries, highlighting the need for greater transparency, communication, and stakeholder engagement.

Challenge 6: Strengthening Regional Cooperation for Shared Solutions

The Mediterranean region presents significant opportunities for knowledge exchange, technology transfer, joint investment initiatives, and collaborative approaches that can accelerate the adoption of successful practices across the region.

3. GUIDING QUESTIONS

- How can Mediterranean countries redesign water around a resilient Water Mix that combines conventional and non-conventional resources?
- What should be the respective roles of efficiency improvements, water reuse, desalination, groundwater protection, and ecosystem restoration in achieving long-term water security?
- What policy, governance, and financing reforms are needed to scale up non-conventional water resources while ensuring affordability, environmental sustainability, and social acceptance?

- How can Mediterranean countries become a global reference region for innovation and cooperation on water scarcity and resilient water systems?

4. EXPECTED OUTCOMES

Outcome 1: Advancing the Water Mix Approach

The discussion will contribute to a shared understanding that water security can no longer rely exclusively on conventional resources. Participants will explore how efficiency improvements, ecosystem protection, and non-conventional water resources can be combined within an integrated Water Mix framework capable of increasing resilience under conditions of structural water scarcity.

Outcome 2: Creating Enabling Conditions for Investment

The panel will highlight the importance of regulatory certainty, innovative financing models, and stronger public-private partnerships.

Outcome 3: Building a Mediterranean Community of Practice

The session will identify opportunities to strengthen regional cooperation through knowledge-sharing platforms, technical partnerships, and collaborative demonstration projects.

Outcome 4: Maximizing the Value of Every Drop

Participants will highlight that addressing water scarcity requires both increasing water availability and improving efficiency, productivity, and strategic allocation of existing resources.

Outcome 5: Positioning the Mediterranean as a Global Laboratory for Water Resilience

The session will showcase Mediterranean experiences in efficiency improvement, water reuse, desalination, governance innovation, and integrated planning as examples that can inform water-scarce regions worldwide.