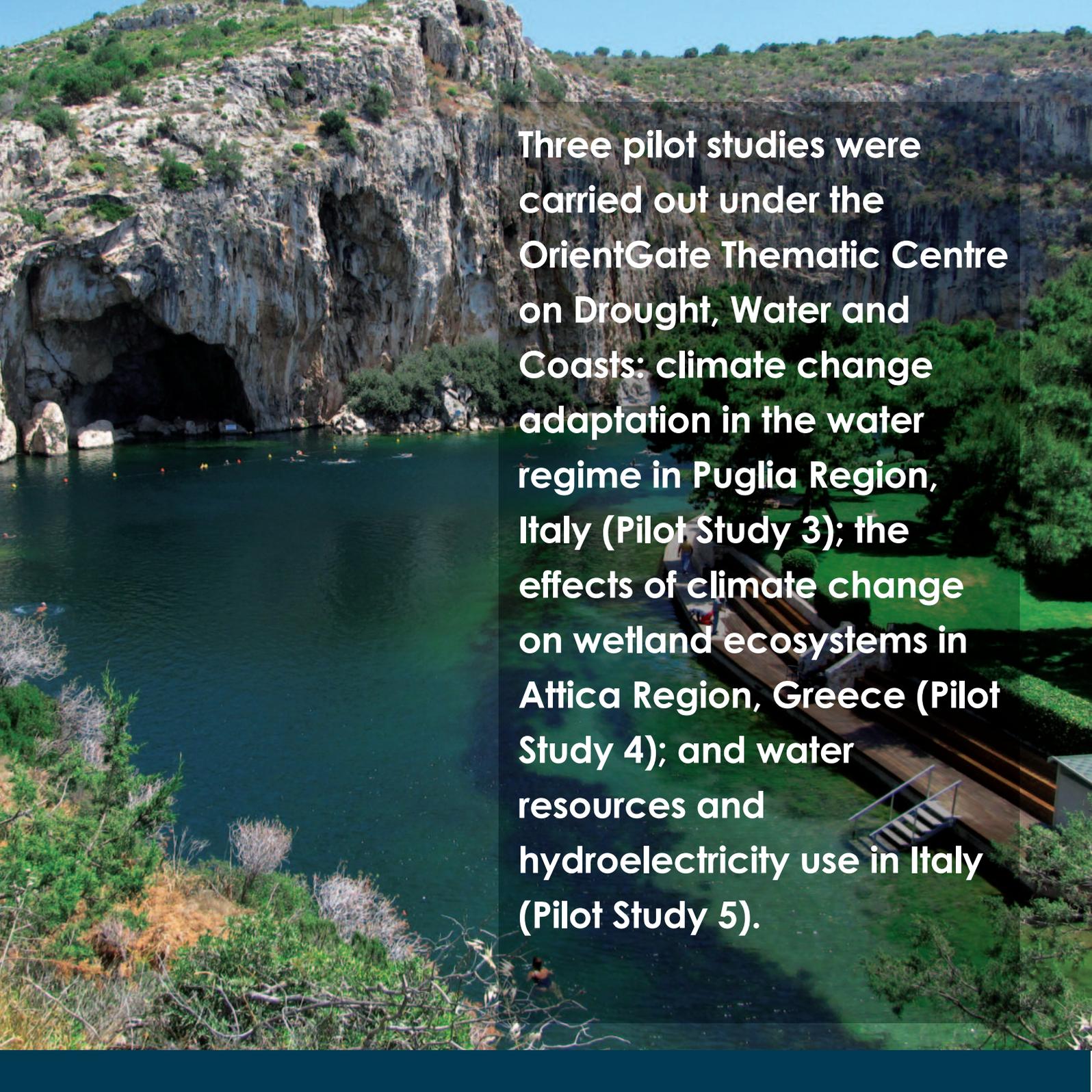




Wetland adaptation in Attica Region, Greece





Three pilot studies were carried out under the OrientGate Thematic Centre on Drought, Water and Coasts: climate change adaptation in the water regime in Puglia Region, Italy (Pilot Study 3); the effects of climate change on wetland ecosystems in Attica Region, Greece (Pilot Study 4); and water resources and hydroelectricity use in Italy (Pilot Study 5).

Combined strengths

In developing environmental policy guidelines at regional level, Attica Region has focused on the protection of wetland ecosystems from the impacts of climate change. Its Environment Directorate, in cooperation with the Greek Biotope Wetland Centre of the Goulandris Natural History Museum, has assessed climate change impacts and anthropogenic interventions and drawn up a strategy. This collaboration has expanded to include central, regional and local services, other authorities, research agencies, environmental organisations and citizens, who have been encouraged to take action through interviews, meetings, workshops and seminars. Experiences have been exchanged; good and bad practices recorded; and the conservation of wetlands and the need for climate change adaptation promoted.

Existing resources

Attica Region faces the combined challenges of a growing population and often competing land-use demands. Wetlands are a significant element of the region's natural environment, not only as habitats but also as part of the region's water resources and as recreational areas. The region has more than 80 wetland areas, including lakes Marathonas, Koumoundourou and Vouliagmeni; the coastal wetlands of Skala Oropou, Schinia, Vravra, Brexiza, Lavrio, Loutsas, Vourkari-Megara, Psatha, Asopos and Kifisos; Pikrodafni and Rafina streams; and the Anavyssos saltmarsh.

As throughout the Mediterranean, land-use changes have been observed in Attica over the last 40 years. The over-abstraction of water; pollution from liquid and solid waste; encroachment; and the destruction of natural vegetation have all led to the degradation of wetland resources. Climate change impacts, exacerbated by anthropogenic pressures, are expected to lead to the disappearance of many transitional wetland systems, while many permanent wetlands are expected to shrink.

Facts and findings

The pilot study carried out in the framework of the OrientGate project focused on projections of the frequency and intensity of future drought episodes in Attica Region, the assessment of wetland vulnerability, and the capacity of agencies to ensure their ability to adapt.

Based on future climate projections, Attica's vulnerability to drought is expected to rise from low to moderate by 2100. Drought episodes are expected to last longer and occur more frequently.

The synergy between drought and human intervention determines the level of wetland sensitivity. Inadequate legal protection and a shrinkage in the size of wetlands by up to 50 percent in the last 40 years have been recorded, along with a degradation in their values in terms of biodiversity



protection, flood control and recreation. Most of Attica's wetlands have been classified as highly sensitive to further degradation.

At the same time, the agencies involved in the conservation of wetlands have an average adaptive capacity. There is insufficient knowledge of wetland ecosystems and their services; a lack of experience in the use and interpretation of climatic parameters; few opportunities for networking and the exchange of experiences and good practices; average operational capacities; and average availability of funds for implementing adaptation measures. In parallel, there is increasing public understanding of the contribution of wetlands to quality of life.

Improving the adaptive capacity of the agencies involved from average to high, and stopping or mitigating anthropogenic pressures are key requirements in the region.

Mitigating impacts

Wetlands are of exceptional importance as they reduce the catastrophic impacts of floods; their vegetation stabilises coastal areas by mitigating the impacts of waves and currents; they improve water quality by trapping sediments, nutrients and toxic substances; and they enable the development of economic activities.

Attica's wetlands are "biodiversity islands" within a broadly degraded environment and offer local inhabitants an opportunity to stay in touch with nature.

The strategy for wetland protection must cover their sustainable management and restoration; their interconnection within a "green arc"; a socioeconomic evaluation of the services they provide; awareness raising and environmental education; as well as public participation. Strategy implementation is expected to mitigate the impacts on wetlands of both anthropogenic interventions and climate change.

Putting results into practice

The Strategy for Wetlands in Attica Region is the result of the integration of climate knowledge into policy and planning. It was prepared on the basis of scientific research carried out by OrientGate partners, including the processing of geospatial data and data on climatic parameters and wetland features, as well as information from programmes and activities currently being implemented.

The strategy incorporates elements from the National Strategy and Action Programme on Biodiversity, the Master Plan of Athens/Attica 2021, the River Basin Management Plan for Attica Water District, and the operational plans of municipalities in Attica Region. It calls for:

- enhanced research on climate change impacts;
- the development of flood forecasting and early warning systems;
- the legal designation of wetlands;
- a network of wetland areas as elements of green infrastructure;
- the implementation of measures to tackle industrial pollution;
- sustainable water use;
- regulations on wetland conservation in the context of urban expansion;
- the raising of public awareness via information centres;
- the protection and restoration of water-related monuments and landscapes (springs on the ancient Erasinos River and the Makaria Spring at Schinias);
- support to inspection and control mechanisms;
- networking, the exchange of good practices, and training for staff;
- the development of policies on the environmental viability and sustainability of enterprises; and
- the prevention of negative impacts during planning.





Pilot Study 1: Adapted forest management at LTER Zöbelbode, Austria

Pilot Study 2: Climate change adaptation measures in Romanian agriculture

Pilot Study 3: Climate change adaptation in the new water regime in Puglia region, Italy

Pilot Study 4: Effects of climate change on the wetland ecosystems of Attica region, Greece

Pilot Study 5: Water resources and the use of hydroelectricity, Italy

Pilot Study 6: Vulnerability assessment in Budapest and Veszprém, Hungary



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