

“An Overview of the Options to Addressing Climate Change Adaptation Challenges in the Mediterranean”

Paper by MIO-ECSDE and GWP-Med

Already a water-scarce region, the Mediterranean is expected to face even more water challenges in the near future due to the looming climate crisis. According to recent studies, the region is among those that are expected to be hit hard by climate change: by 2100, the rise in temperature would be in the range of 2.2 and 5.1°C while total precipitations are likely to fall by 4 to 27%, with an especially marked drop in summer.

The increasing frequency and severity of droughts, floods and other extreme weather events will not only mean increased water supply-demand gap, but are also foreseen to have (and have already) other important impacts on the region: accelerated desertification, infrastructure damage, loss of inhabitable and arable land due to soil erosion and landslides, serious alterations of natural habitats and damages in important ecosystems, enhancement of the already noticed saltwater intrusion due to sea-level rise, health issues, etc., jeopardising the region’s overall well-being.

Anthropogenic pressures from urbanisation, agriculture, industry, tourism, etc. have already aggravated the situation of all water bodies, including the Mediterranean Sea itself. As a result, the Mediterranean is facing serious problems with pollution from land-based activities, tightly connected to the release of non-treated municipal sewage and industrial waste waters into rivers and the sea. A number of regional pollution ‘hot spots’ that need urgently to be dealt with include water infrastructures (mostly wastewater treatment plans) and have been identified by the countries of the region through regional schemes coordinated *inter alia* by UNEP’s Mediterranean Action Plan and the European Union. The recently launched ‘Horizon 2020’ Initiative aims at reducing the pollution loads from land based sources and called for support from all involved parties in tackling the issue.

On the occasion of the Side-Event on *Addressing Climate Change Adaptation Challenges in the Mediterranean*, jointly organized with the Hellenic Ministry of Environment and the Mediterranean Action Plan (UNEP/MAP) and the European Commission, in the framework of the 16th Commission for Sustainable Development (15 May 2008, New York), MIO-ECSDE and GWP-Med have grouped the suggestions made by various relevant bodies for the formulation of appropriate approaches and measures to tackle adaptation and to a certain extent also mitigation challenges in the Mediterranean region. It is noteworthy that the measures suggested for the areas mentioned below, need to be completed by the well-known horizontal, cross-cutting issues of wise integrated management such as good governance, appropriate awareness raising, education for sustainable development, meaningful public participation/stakeholder involvement and the wide use of financial instruments.

i) Water resources

- a. Mainstream adaptation measures into national IWRM planning/policies
- b. Promote water efficiency and demand management (i.e. water pricing policies for households, industry and agriculture; improved irrigation techniques, virtual water, water cuts)
- c. Develop non conventional water resources to match increased demand, such as rainwater harvesting, water retention and collection systems, appropriate wastewater treatment and reuse, desalination, groundwater recharge)

ii) Civil protection from extreme weather events

- a. Develop early warning systems for extreme weather events (i.e. heat and cold waves, floods, droughts, forest fires) and regional cooperation in this field
- b. Increase public awareness on climate change impacts

- c. Discourage new construction of settlements/housing/infrastructure in areas prone to floods and landslides
- d. Develop flood protection systems up-stream and protection systems against sea-level rise on the coastlines accordingly
- e. Relocate vulnerable communities and/or activities in less flood-prone areas

iii) Ecosystems

- a. Protect important ecosystems, in particular wetlands, from over-extraction of water especially during drought periods, ensuring adequate water for their ecological functioning
- b. Conserve wetland systems (i.e. flood plains, river deltas) useful as buffer zones for flood protection
- c. Protect forests and maquis-covered areas from wildfire risks (through monitoring and early intervention) and from overgrazing
- d. Calculate and introduce the valuation of ecosystem services as an integral part of IWRM, adaptation and sustainable development strategies

iv) Agriculture/forestry/land use/coastal zones

- a. Encourage the use of drought resistant crops in arid zones
- b. Promote efficient irrigation techniques
- c. Maintain or reintroduce soil retention and water harvesting techniques
- d. Protect arable land in coastal zones from saltwater intrusion by avoiding groundwater over-extraction, by developing sound groundwater recharge practices and barriers to saltwater intrusion, when appropriate
- e. Protect forests from wildfires through increased awareness raising, monitoring and on-site infrastructures to retain water in order to prevent soil erosion and subsequent risk of floods, landslides and desertification as well as further warming
- f. Avoid the development of settlements, infrastructures (i.e. industry) and activities in zones prone to sea-level rise in the next 20-30 years

v) Energy/industry/transport

- a. Promote bio-climatic architecture (incl. passive cooling and heating techniques, retrofitting of buildings) to cope with increased temperature variability and avoid further warming
- b. Encourage energy-saving measures and techniques – *inter alia* through pricing policies - for households, industry, transports, etc.
- c. Foster the development of renewable sources of energy, in particular solar (photovoltaic, thermal), wind, wave and geo-thermal
- d. Envisage the use of small hydropower systems in such a manner that they can be combined to water storage and flood protection and minimize undesirable side-effects for ecosystems

vi) Tourism

- a. Promote water efficiency measures and use of non conventional water resources (i.e. waste water reuse) in the tourism sector
- b. Avoid the development of large-scale and/or water-intensive tourism activities in arid areas (i.e. golf complexes)
- c. Promote alternative/sustainable tourism activities during seasons less prone to drought and heat waves