



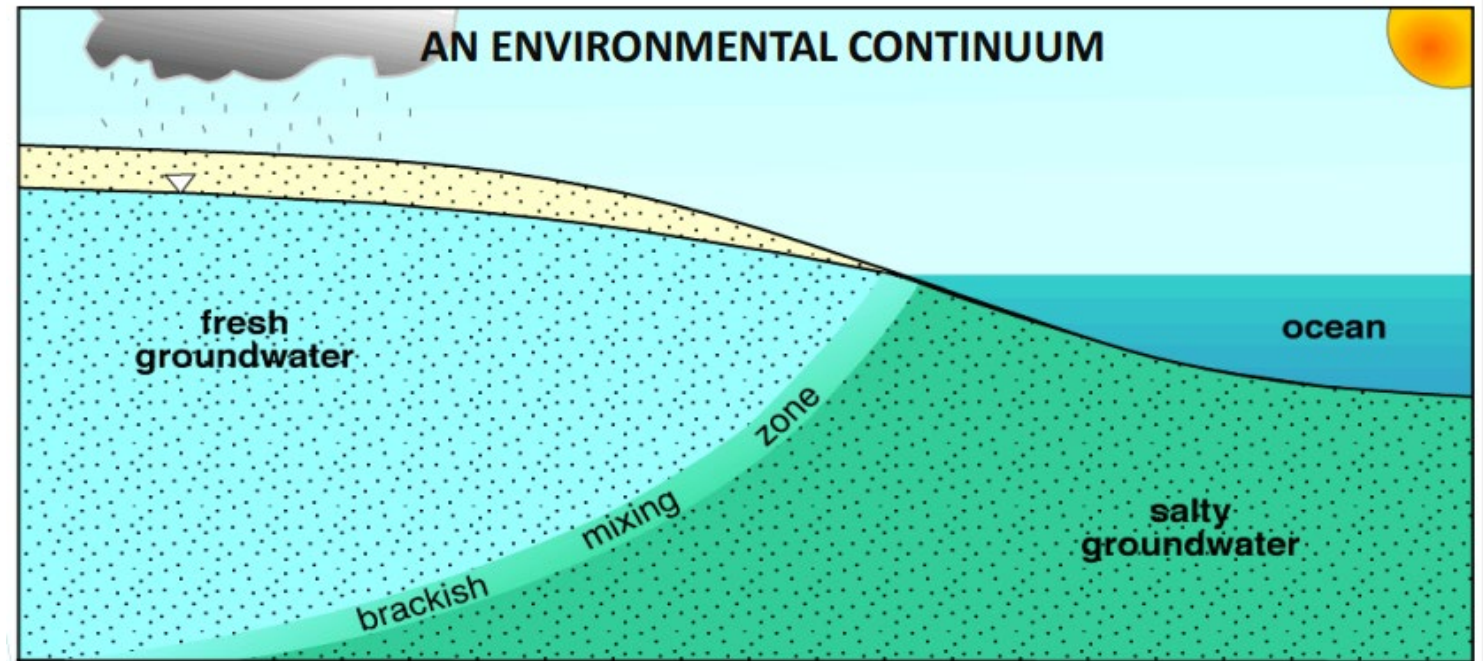
UNESCO Component 2: Management of Coastal Aquifers and Related Ecosystems in the Mediterranean



Mediterranean
Action Plan
Barcelona
Convention



WHY COASTAL AQUIFERS?



Major Perceived Environmental Concerns TDA 2005 (Barcelona Convention): Decline of Biodiversity, Decline in Fisheries, Decline in Sea Water Quality and Human Health Risk

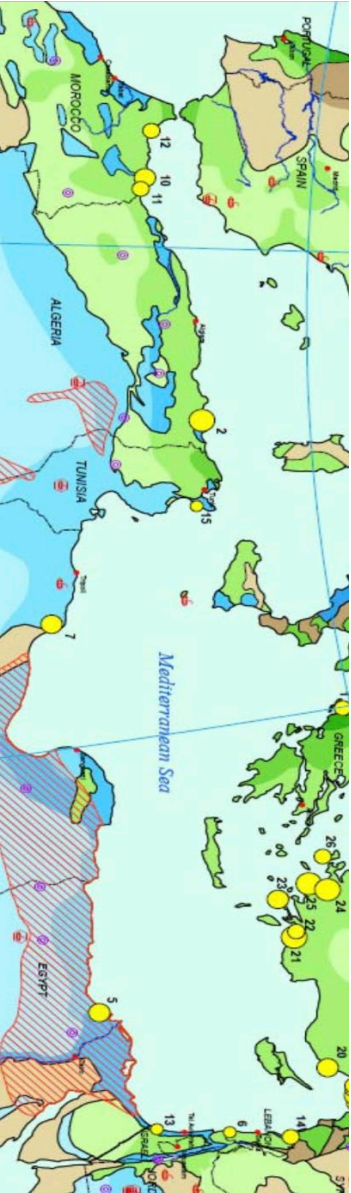
All coastal aquifers contribute to the integrity and functioning of the coastal zone and marine ecosystems, and their degradation reflects upon, and contributes to the major transboundary issues affecting the LME Mediterranean Sea

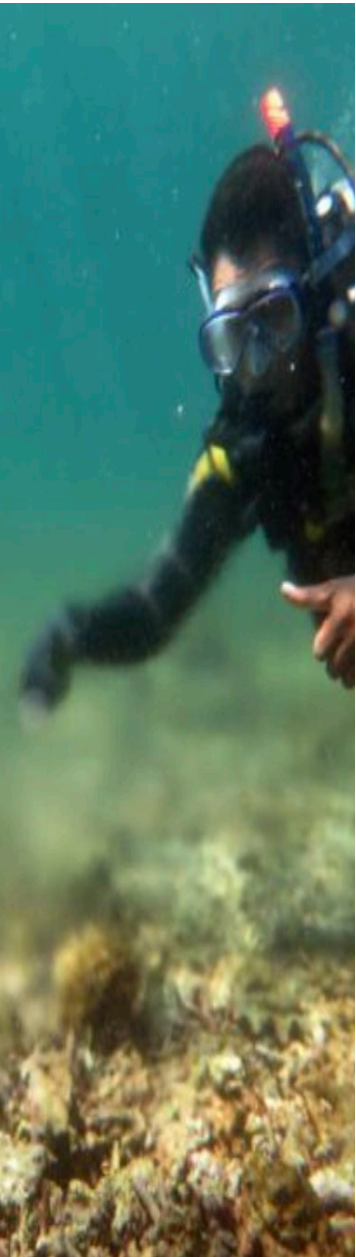
TRANSBOUNDARY IMPORTANCE OF COASTAL AQUIFERS IN THE MEDITERRANEAN REGION

Coastal aquifers are **a major water resource** all along the Mediterranean coastline and often represent the main source of drinking water for the growing littoral population.

Coastal wetlands, lagoons, humid zones and coastal habitats, providing very valuable services and contributing to coastal livelihoods, are all in part or totally **dependent on groundwater** regimes.

Submarine groundwater discharges are large (>25%), and in places superior to surface water inflows. Hence coastal aquifers contribute to, and sustain **shallow marine water quality and ecosystems**

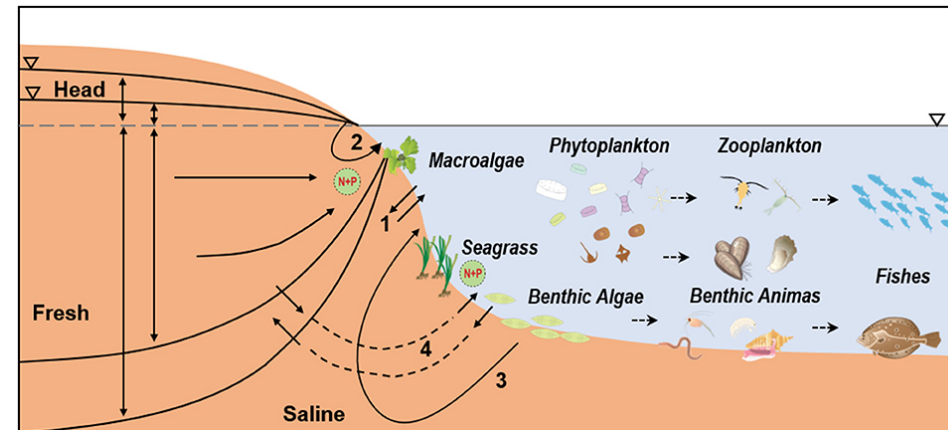




COASTAL AQUIFERS AND THE HEALTH OF THE MEDITERRANEAN SEA

Seawater intrusion is the movement of seawater into freshwater aquifers due to natural processes or human activities. Seawater intrusion is caused by decreases in groundwater levels or by rises in seawater levels. Intrusion affects the **quality of water and the health of groundwater dependent ecosystems**.

Nutrients such as nitrates and phosphates in coastal aquifers are a serious concern in certain parts of the Mediterranean. Excess nutrients in water have led to **water quality problems** such as algal blooms, eutrophication in a number of surface water bodies, affecting living marine resources and human health.



COASTAL AQUIFERS AND THE HEALTH OF THE MEDITERRANEAN SEA

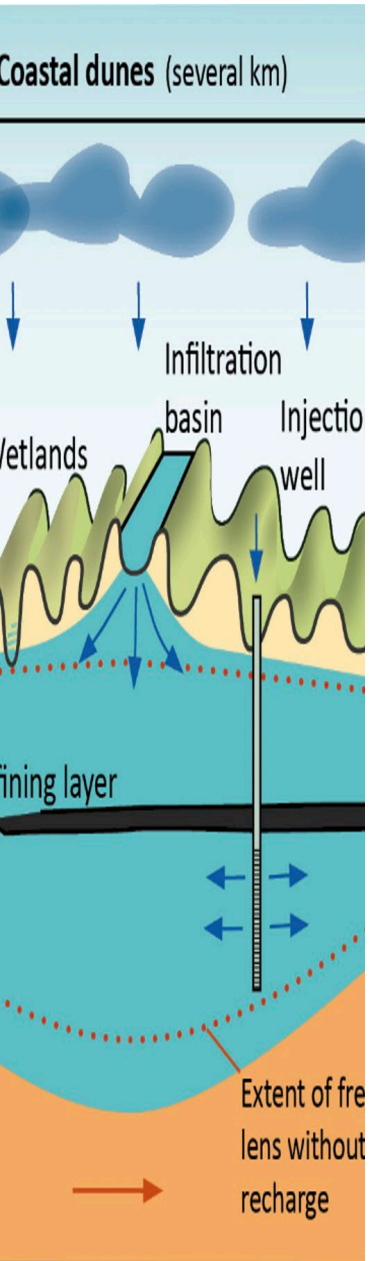
Research and existing quantitative data indicate a regionally preponderant **medium to high level** of contamination from **nutrients**, and other hazardous substances. **Medium to high salinization** is locally present in about 70% of the aquifers and often attributed to seawater intrusion.

The degradation of coastal aquifers and coastal freshwater ecosystems along large sections of the Mediterranean coastline is an indicator of the growing level of **environmental stress** affecting the coastal zone and shallow marine ecosystems.

The regional picture that emerges from the assessment of the current state of these critically important resources is one of **generalized neglect and progressive degradation**.

The **Mediterranean Sea TDA Coastal Aquifer Supplement 2012** has recognized the contribution of coastal groundwater degradation to exacerbating issues of transboundary concern at the **LME** level, such as nutrient pollution, habitat and coastal freshwater dependent ecosystems degradation.





POLICIES, LEGAL AND INSTITUTIONAL FRAMEWORKS

These major issues of transboundary concern are affecting most if not all Mediterranean coastal aquifers. They are ultimately attributable to **the lack of policy and sustainable legal and institutional frameworks** for coastal aquifer management.

Management frameworks for coastal groundwater are absent, and these resources are not formally recognized as critical for the sustainability of coastal developments, and as being highly vulnerable.

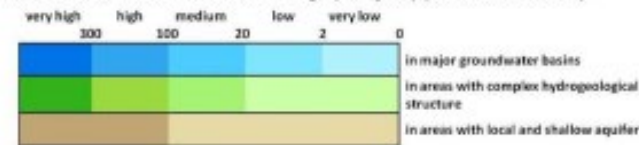
Unregulated exploitation is common, and **no quality-quantity safeguards exist or are applied**. Conflicts among uses (agriculture, domestic, tourism, environment, energy...) are common and potentially disruptive. Lack of **conjunctive management of surface and groundwater**.

Scientific knowledge and public awareness on coastal aquifers is scanty or non-existent in most countries. **Monitoring is occasional at best**, lacks modern technologies and strategic, multi-purpose design.

Main Mediterranean coastal aquifers and representative wetlands assessed by UNESCO-IHP for the MedPartnership



Groundwater resources and recharge (mm/year) (Source: WHYMAP)



Strategic Partnership for the Mediterranean Sea Large Marine Ecosystem

Together for the Mediterranean Sea

MedPartnership

GEF UNEP

United Nations Educational, Scientific and Cultural Organization

International Hydrological Programme

unesco

Intergovernmental Hydrological Programme

GEF MedProgramme Child Project 2.1 “Mediterranean Coastal Zones, Water Security, Climate Resilience and Habitat Protection”

UNESCO Component 2: Management of Coastal Aquifers and Related Ecosystems (2021-2025)

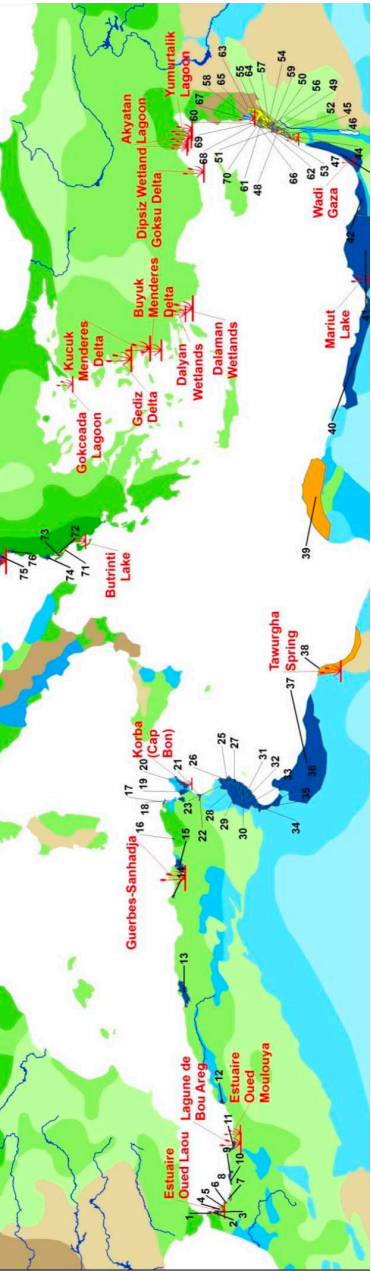
GOAL

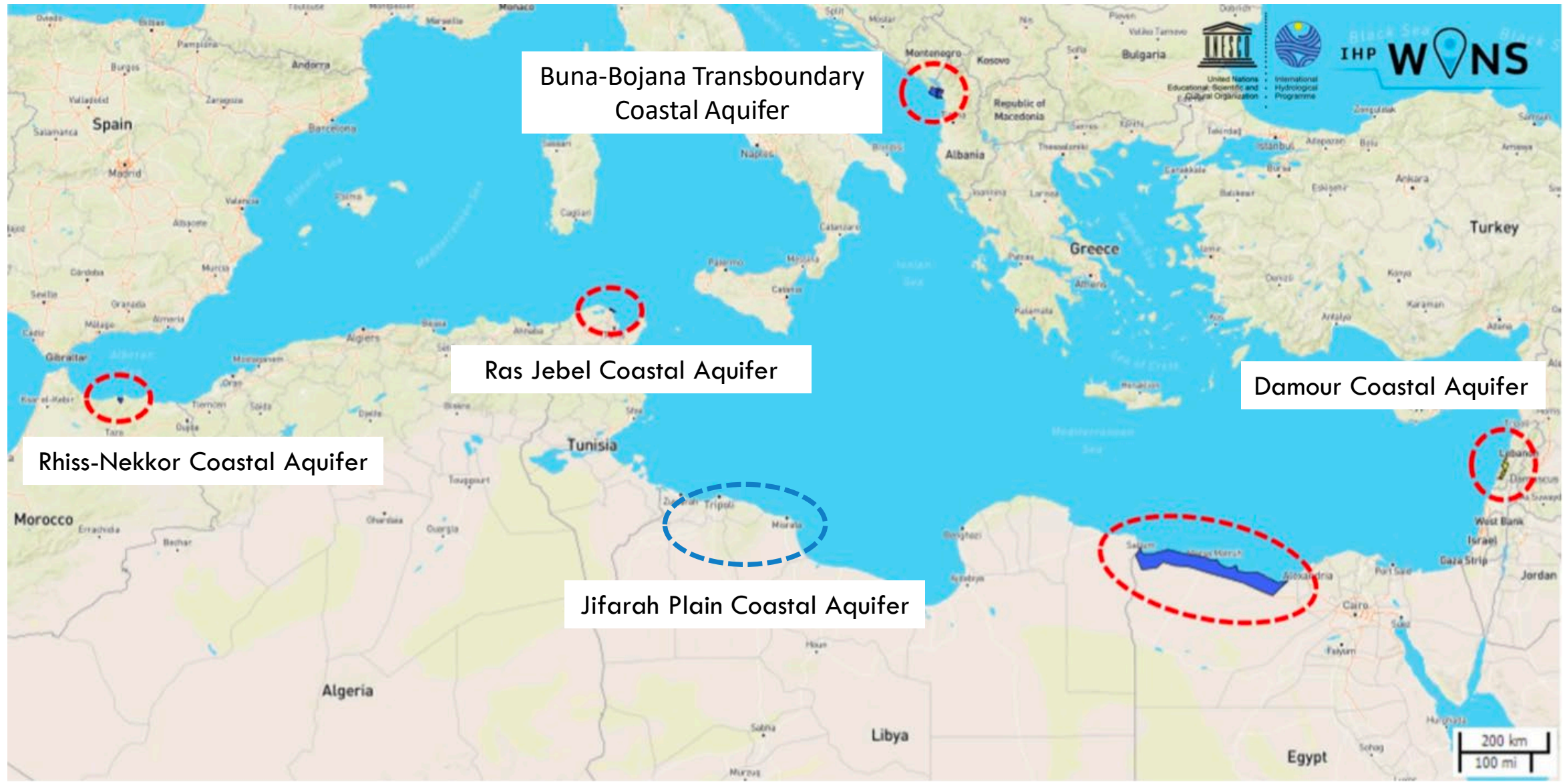
Implement sustainable management policies and practices in the **Five Coastal Aquifers** considered of priority importance by the countries.

Support the implementation of actions foreseen in the two **Sub-Regional Action Plans** developed under the MedPartnership (Adriatic Basin; and South, Central and Levantine Basin) on the sustainable management of coastal aquifers and groundwater-related ecosystems agreed upon by the countries as part of MedPartnership.

OUTCOME

Increased resilience to climatic variability and change, and enhanced water security of coastal populations through improved sustainability of services provided by coastal aquifers and by groundwater-related coastal ecosystems.





Location of the priority aquifers for Component 2 of CP 2.1

MedProgramme CP 2.1 Output 2.2: National dialogues for potential conjunctive management solutions and training modules



- ✓ *Stakeholder analysis carried at national level*
- ✓ *National dialogues identifying potential conjunctive management solutions*

Table 1
Putting Conjunctive Water Management into practice: activities and techniques

At area-wide planning level	Activities and techniques at the level of implementation in the field		
<p>Incorporating all water components</p>	<p>Optimal selection of source of supply</p>	<p>Resource augmentation</p>	<p>Environmental control</p>
<ul style="list-style-type: none"> ▪ Exploring and analysing hydraulic connectivities and exchanges of water ▪ Preventing ‘double counting’ ▪ Identifying promising opportunities ▪ Identifying hazards of harmful interaction 	<ul style="list-style-type: none"> ▪ Conjunctive use of surface water and groundwater 	<ul style="list-style-type: none"> ▪ Managed aquifer recharge (MAR) ▪ Watershed management ▪ Desalination of brackish and saline water ▪ Recycling treated wastewater 	<ul style="list-style-type: none"> ▪ Water level control in polder / low-low-lying and reclaimed areas ▪ Groundwater level control in surface water irrigated zones ▪ Restricting groundwater pumping to control surface water environmental flows ▪ Managing wastewater