Conférence Parmenides IX – GID-CIHEAM – Bari – octobre 2021
Gestion durable des bassins versants méditerranéens face aux impacts des changements sociétaux et climatiques

Manuel Sapiano

Managing a vulnerable groundwater resource - Malta

Summary

Malta's semi-arid Mediterranean climate and geomorphology precludes the development of economically exploitable surface water resources. The islands' groundwater resources, in particular the main sea-level aquifer systems, are therefore the only naturally renewable resource of freshwater present on the island. Groundwater within these aquifer systems in in lateral and vertical contact with sea-water, and hence highly vulnerable to sea-water intrusion in response to abstraction.

Malta's policies for the water sector therefore take into consideration the sustainable use of groundwater resources within a comprehensive management framework based on the conjunctive use of water supply diversification and demand management measures. This strategy aims to enable the effective use of groundwater, protecting its qualitative characteristics and therefore ensuring its sustainable use in the future.

Gestion soutenable des bassins versants méditerranéens face aux impacts des changements sociétaux et cimatiques

Conference Parménides IX

Bari – Italy, 20 October 2021

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Session 2

TABLES RONDES VULNERABILITES

Table ronde 2.1: Qualité des eaux, remontées saliens, alcalinisation

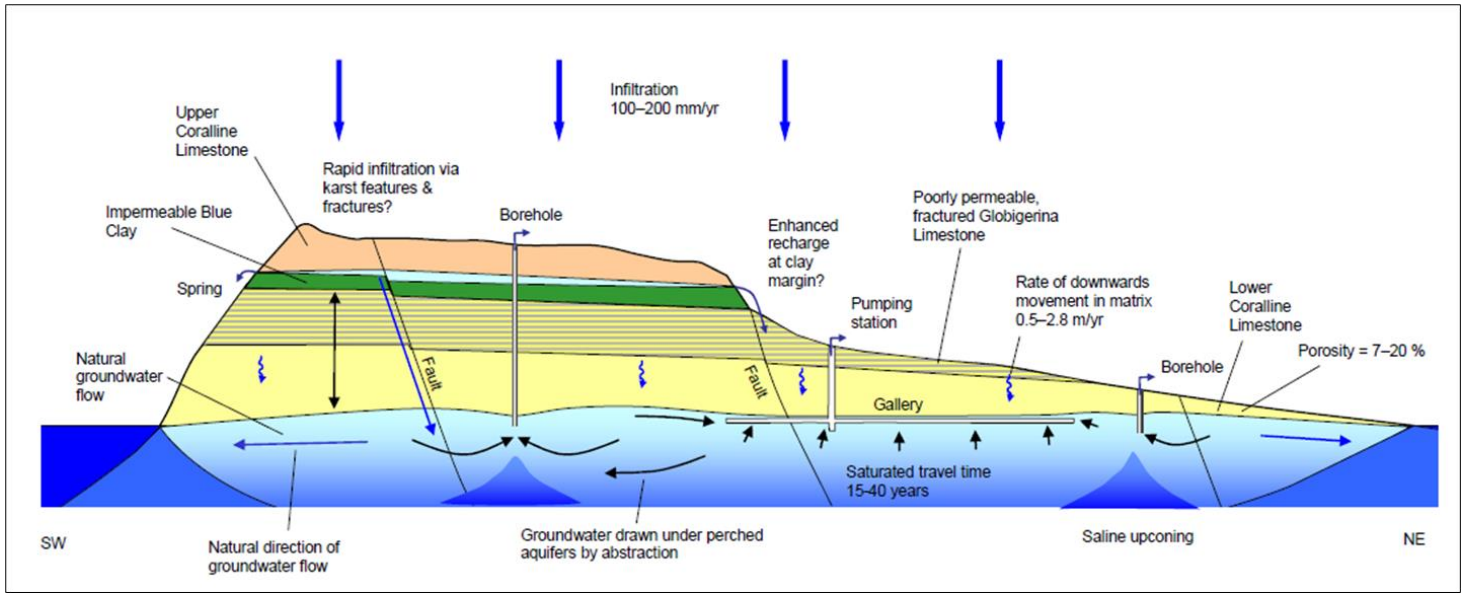
Round table 2.1: Water quality, saline lifts, alkalization

MANAGING A VULNERABLE GROUNDWATER RESOURCE

CONTEXT

Coastal and Island Aquifer Systems:

- in vertical and lateral contact with sea-water,
- highly vulnerable to sea-water intrusion in response to abstraction,
- regional intrusion facilitates localized intrusion of sea-water.

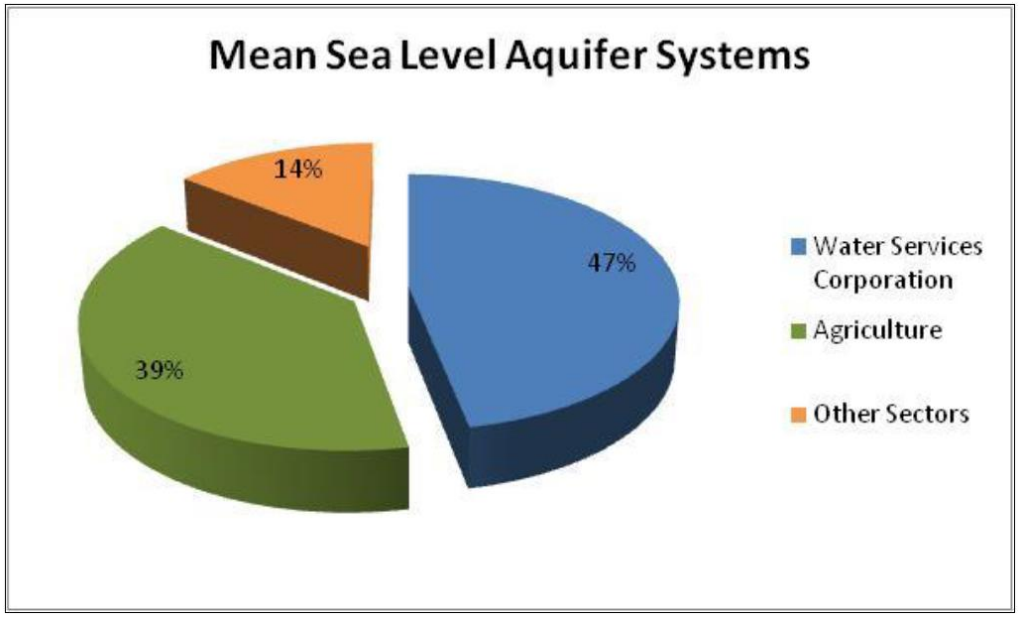


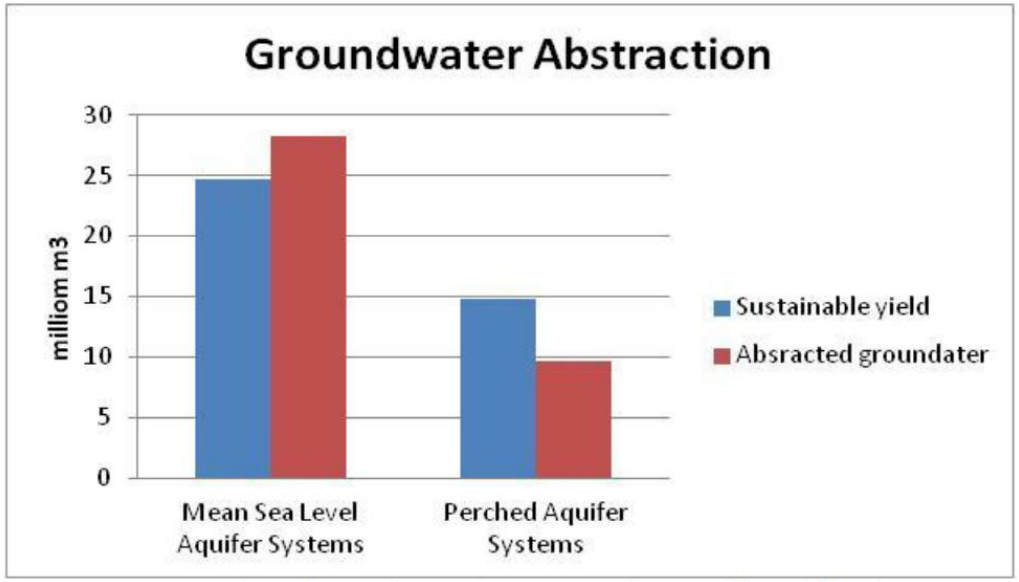
Malta

Relevance to Malta:

- Mean sea-level aquifer systems are the main resource of naturally renewable freshwater.

- Overabstraction (including historic overabstraction) has resulted in sea-water intrusion.

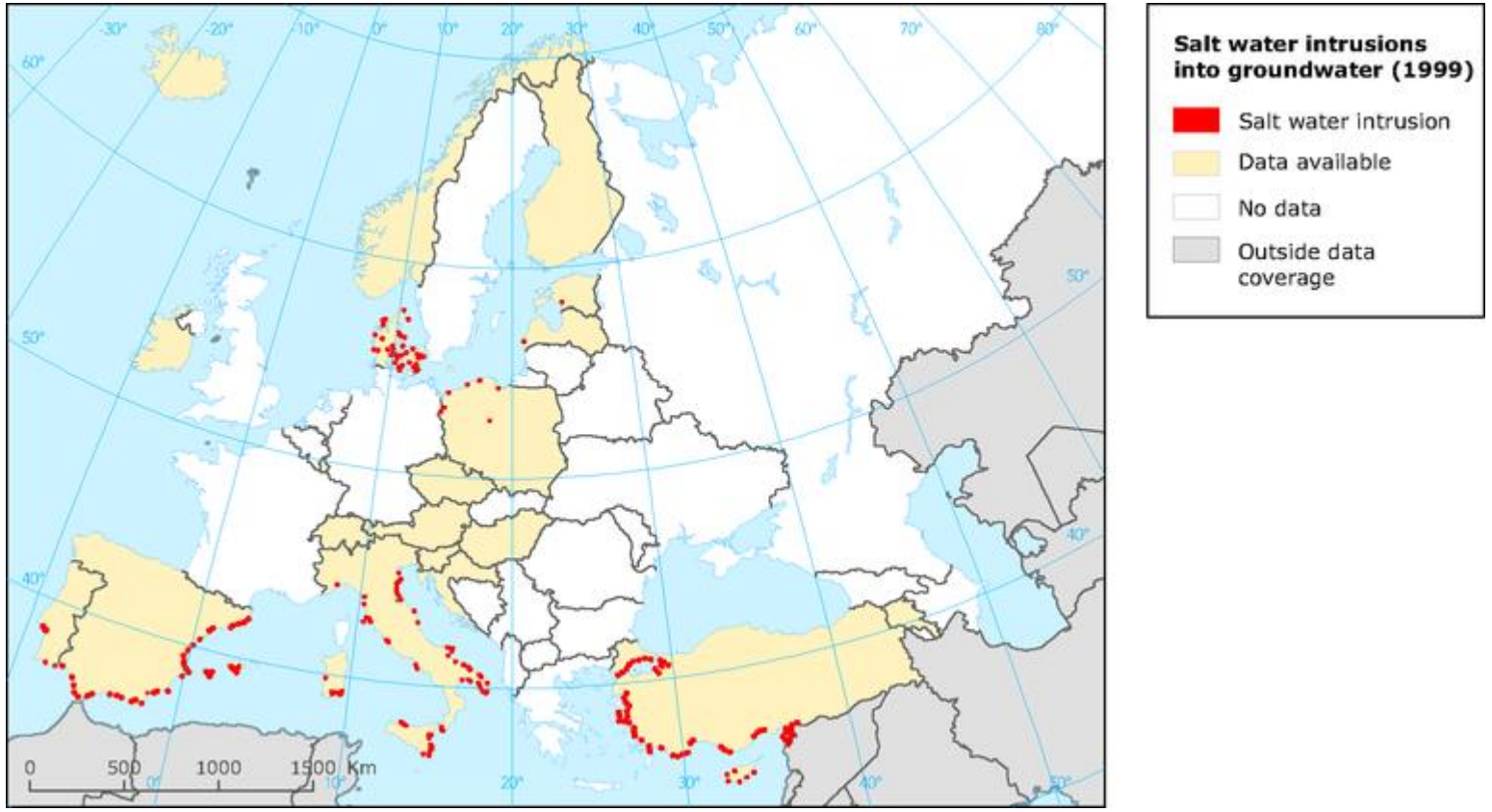




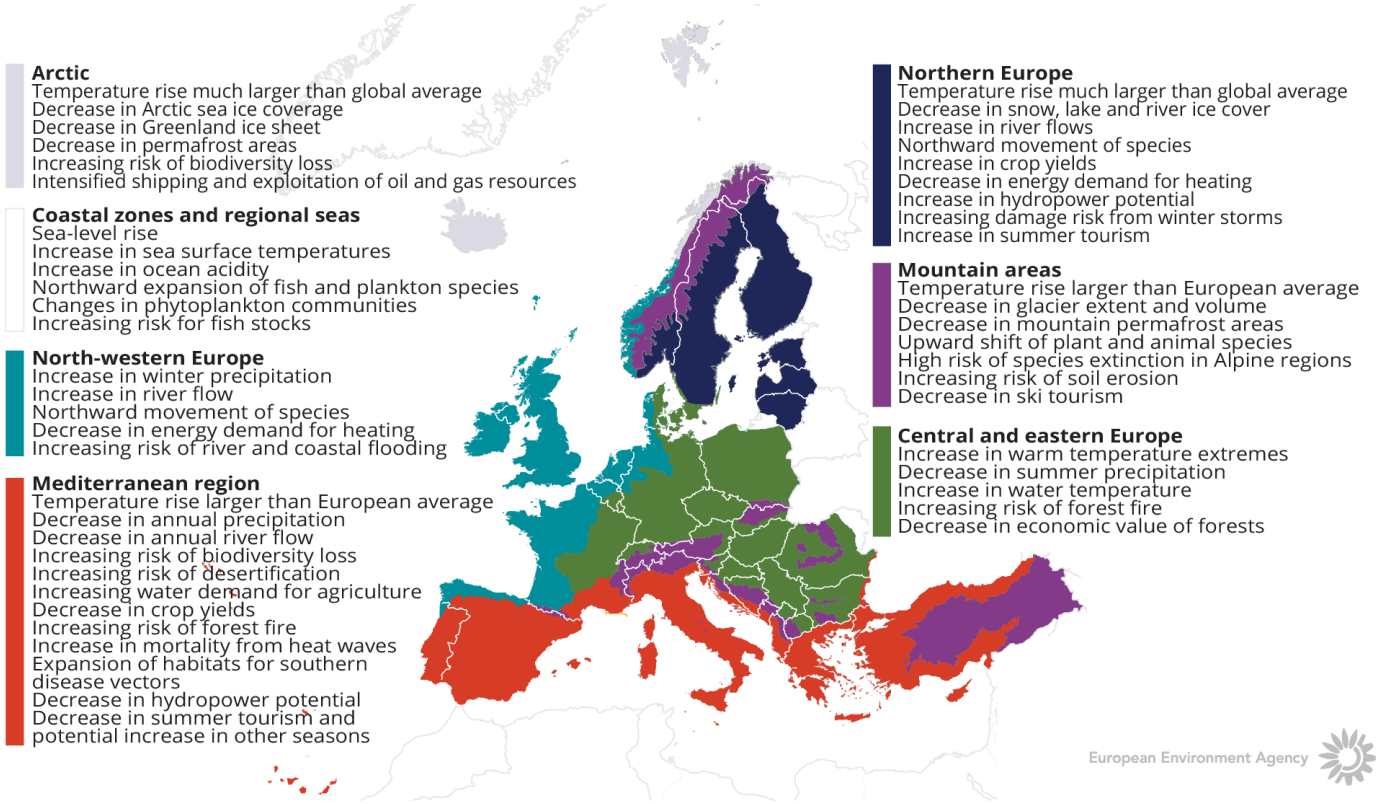
Mediterranean

Sea-water intrusion is highly relevant for all Mediterranean coastal aquifers.

Impact arises due to high water demands – urban hotspots and agriculture.



Climate Change



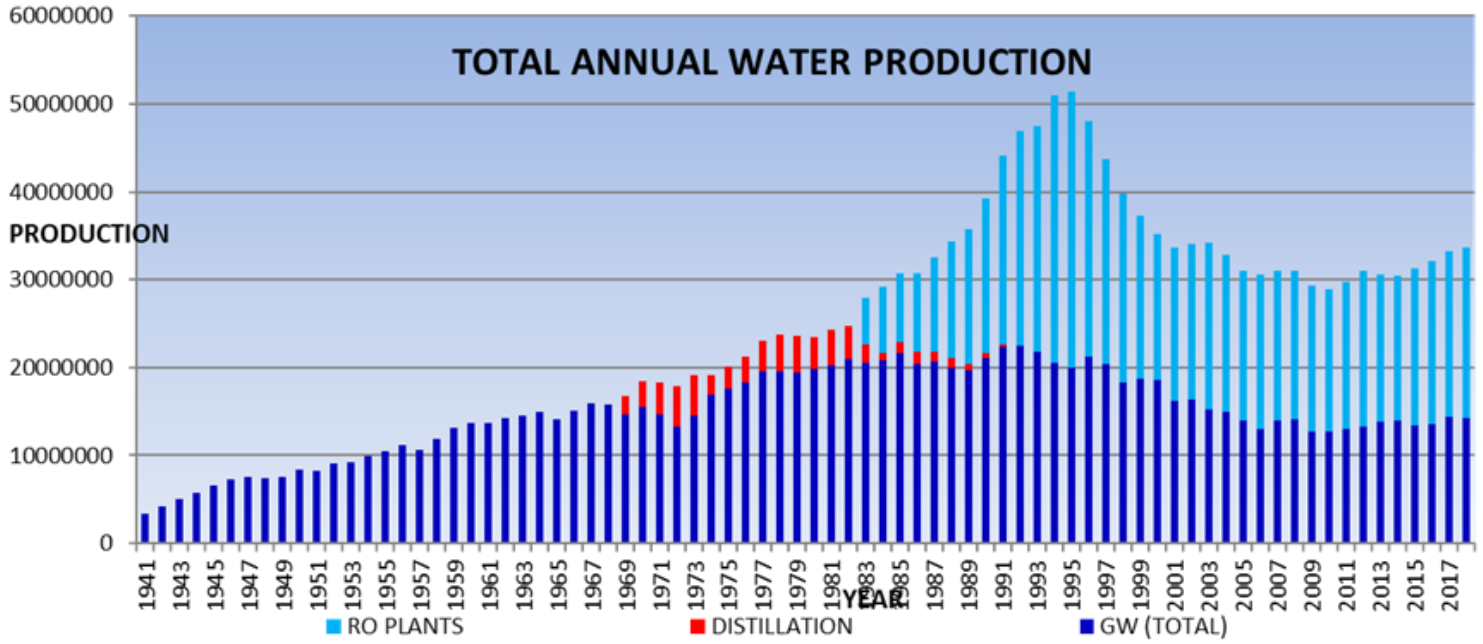
- Temperature Rise (increased losses by evapotranspiration).
- Decreased Precipitation.
- Increasing water demand for agriculture.
- Increased occurrence of extreme events.

Malta's water story

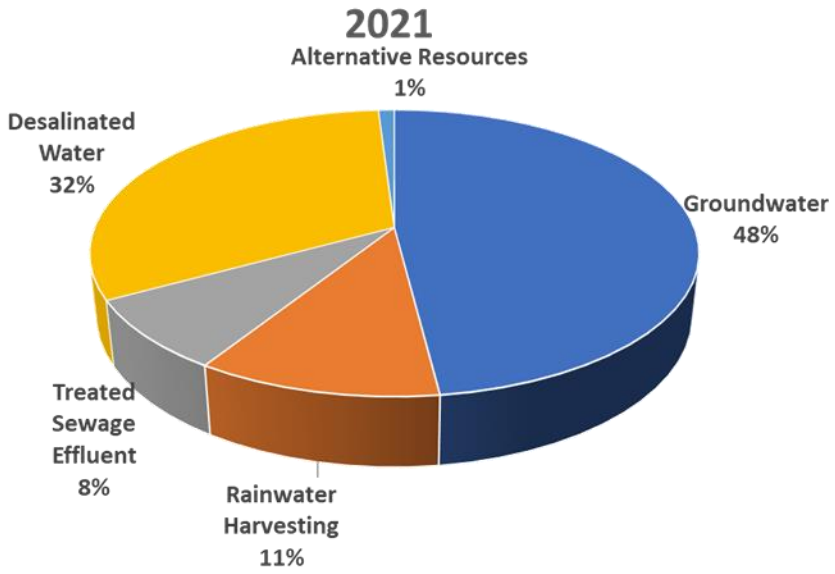
Up to 1997: Water policies based on supply augmentation

Production increases not sufficient to meet national water demand

Aquifers under stress leading to salinity increases in abstracted groundwater.



Malta's water story



It became increasingly clear that water supply augmentation measures alone could not address Malta's water challenge.

Water supply augmentation measures had to be accompanied by water demand management measures.

Factors such as:
- Supply Diversification (Non Conventional Water Resources)
- Water Efficiency (National and User Level)
- Energy Efficiency

gained increasing importance in the water management framework.

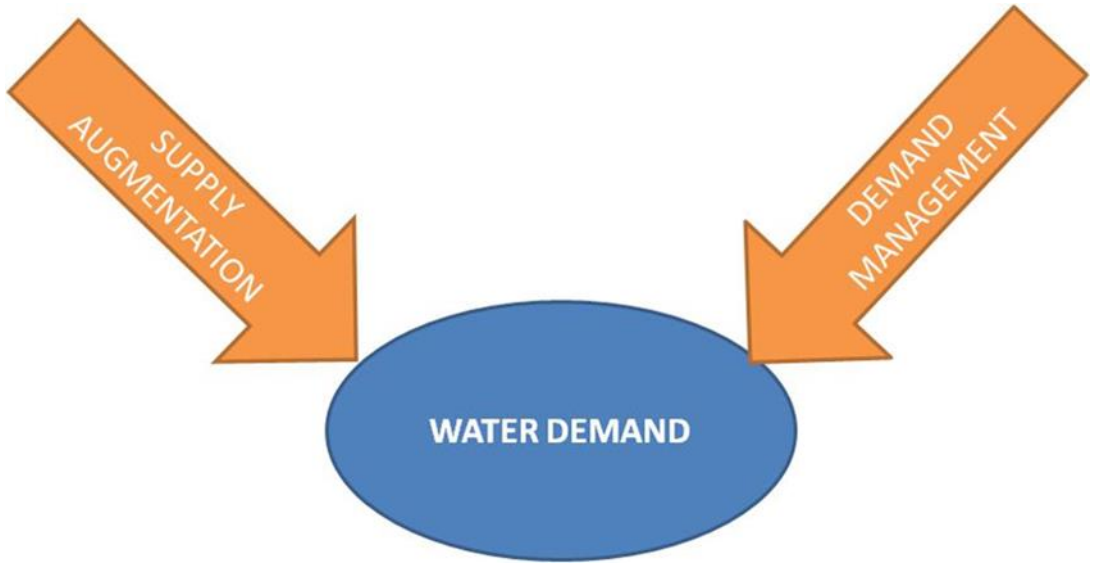
And this approach still forms the basis of Malta's water policy today.

Policy Approach

Under these circumstances, development of a water management framework needs to starts with acknowledging reality.

Even if water demands are kept at highly efficient levels, there is insufficient natural freshwater resources to sustainably meet national demand.

Malta's water management framework is based on a two-pronged strategy to achieve water security: meeting water demand through the conjunctive use of water supply augmentation and water demand management measures, in an increasingly sustainable manner.



Optimizing Management

Optimizing the management of coastal groundwater systems.

(i) Understanding better the groundwater system

- Regulating groundwater abstraction
- Defining sustainable yields

(ii) Optimizing the use of water

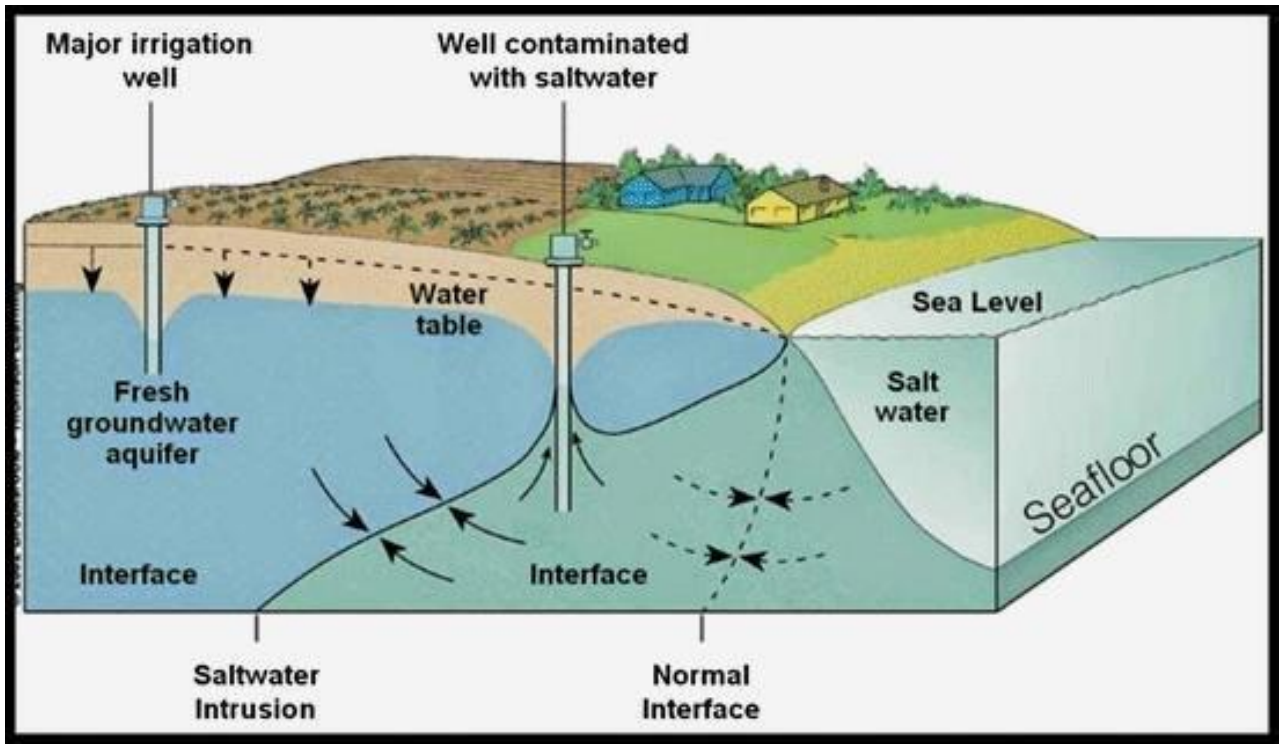
- Lowering water demands

Improved Understanding

Monitoring the development of the freshwater-saltwater interface.

Improved monitoring systems:
- Water level
- Interface (transition zone) variations
- Multi-level sampling or profiling

Numerical modelling and scenario testing.

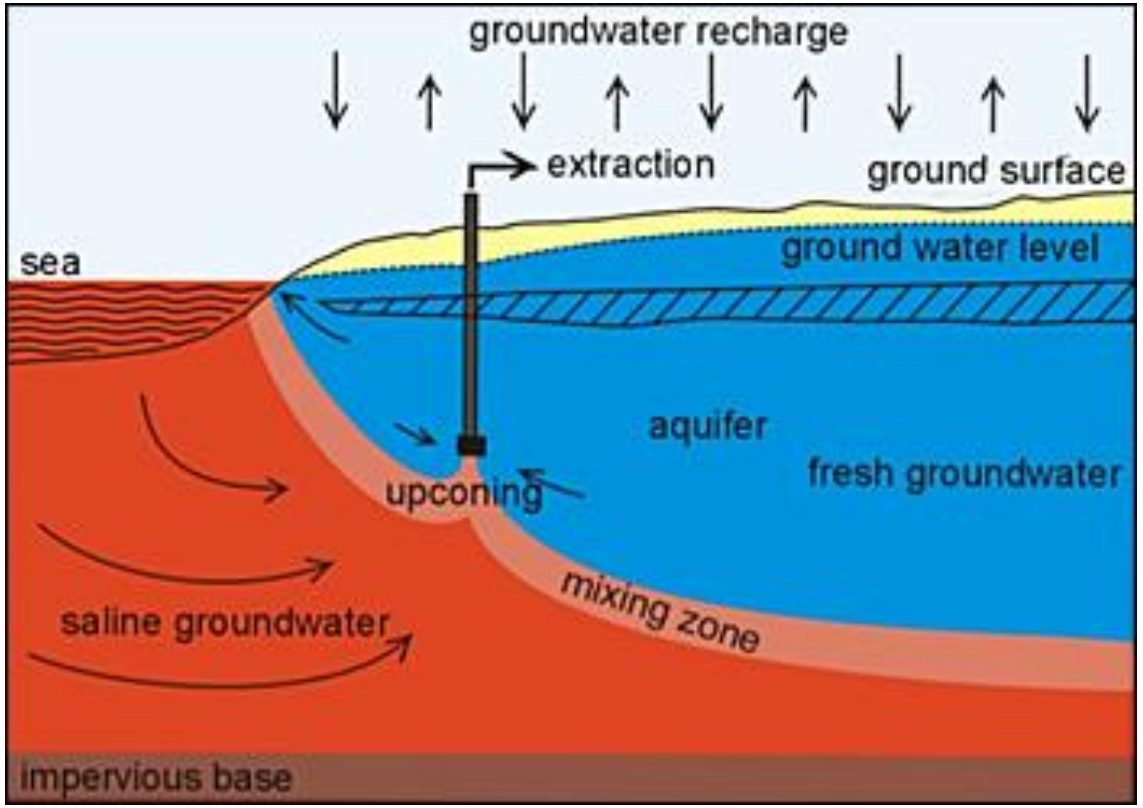


Optimizing Management

(i) Regulating the construction of groundwater abstraction sources (well depth, location, ….).

(ii) Regulating abstraction rates from stations.

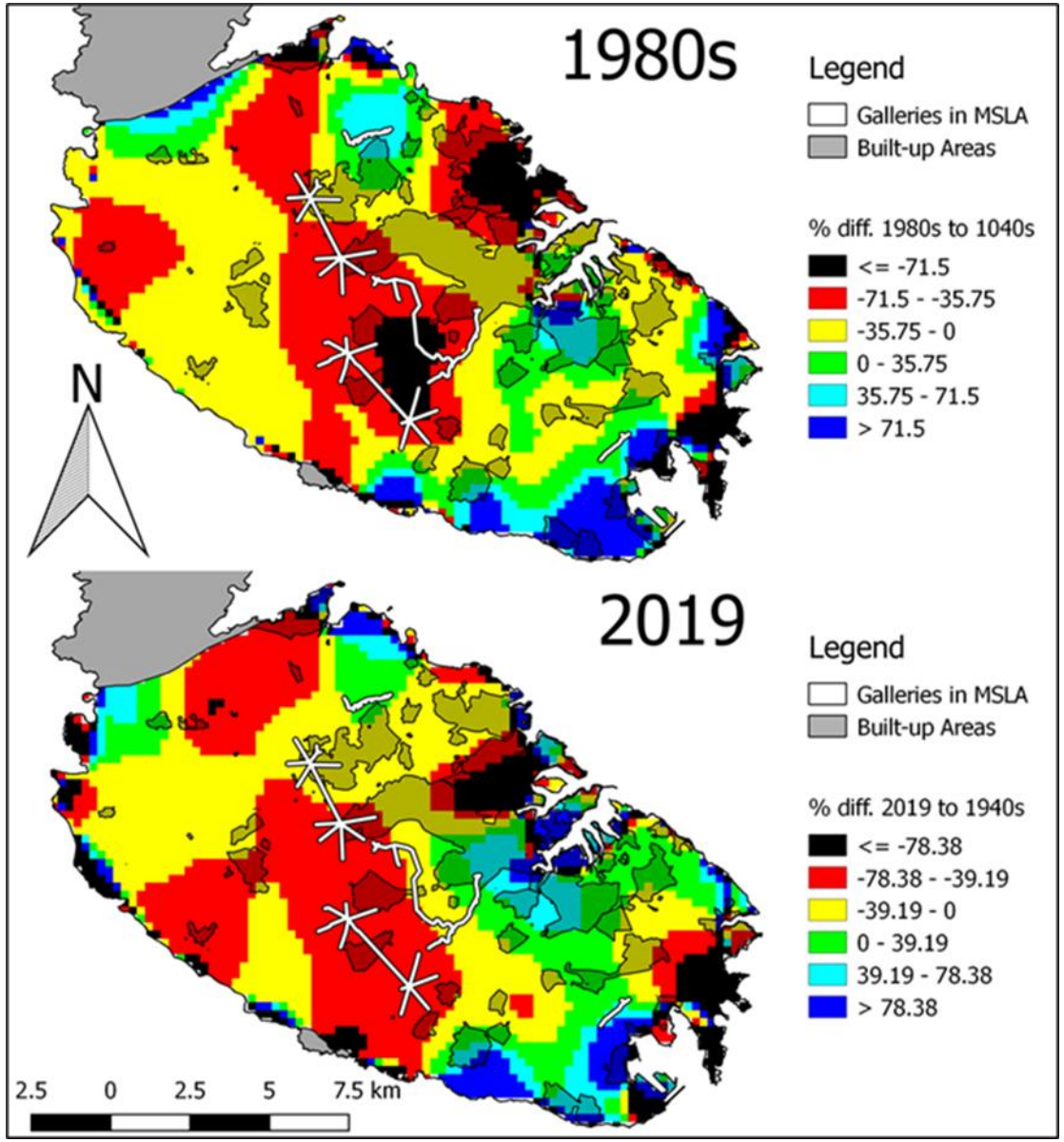
(iii) Spreading abstraction sources over the whole area of the aquifer system.



Conclusion

“Groundwater cannot be protected in isolation” but within a comprehensive water management framework.

But, in coastal aquifers specific (and unconventional) abstraction management techniques are important to limit the onset of sea-water intrusion.



Thank-you for your attention

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