

Under the High Patronage of His Majesty King Mohammed VI



**XIX WORLD WATER CONGRESS**  
International Water Resources Association (IWRA)  
Marrakech, Morocco | 1-5 December 2025

Kingdom of Morocco



Ministry of  
Equipment and Water

# Desalination in the Mediterranean: Toward Inclusive, Sustainable, and Resilient Water Futures

Mr. Samson Bellières, Water Projects Manager and GIS expert at Plan Bleu

01/12/2025



# PLAN BLEU, a center of expertise for development and the environment



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• **A non-profit organization** (under the 1901 French law) supported by France since 1977.

• **One of the 6 Regional Activity Centers** of the Mediterranean Action Plan (MAP) of the United Nations Environment Program (UNEP) to serve the (21 + EU) **Contracting Parties of the Barcelona Convention (1976)**

• Our – transversal – mandate – not linked to a specific protocol:

- Understanding the state of the environment: *Climate Change, Tourism, Water*
- **Foresight studies**
- **Monitoring the Mediterranean Strategy for Sustainable Development: indicators, data & statistics**
- **Finance and economic tools** (how to finance the transition)



# Previous Studies on the Unconventional Water Resources (2024)



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In 2024, **4 reports** were published by Plan Bleu on the unconventional water resources. In addition, **63 interactive open-access** and innovative maps on water topic (**27 on the unconventional water resources**) at Mediterranean level, in the Plan Bleu Observatory.



National regulations, plans & strategies in Mediterranean countries regarding non-conventional water use

Opportunities and risks of desalination activities in the Mediterranean in the face of climate change and growing water needs

Desalination in the Mediterranean: Measures to Mitigate Environmental Risks and Impacts

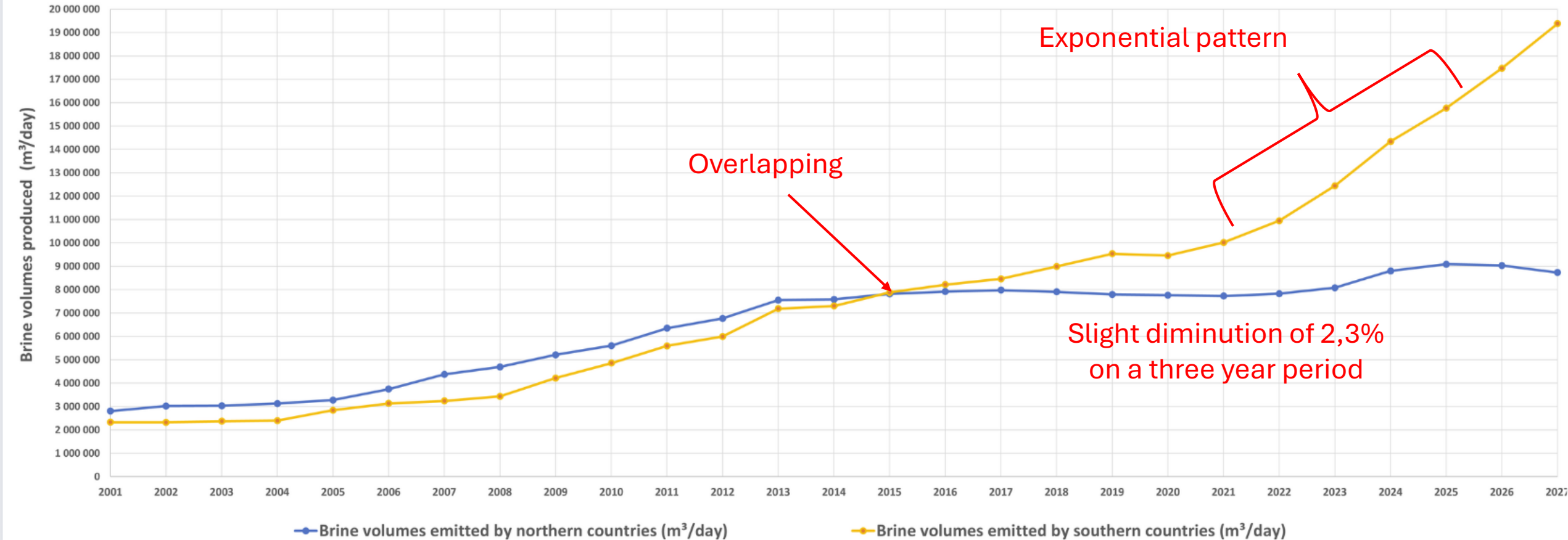
Variability of economic costs incurred by desalination in the Mediterranean



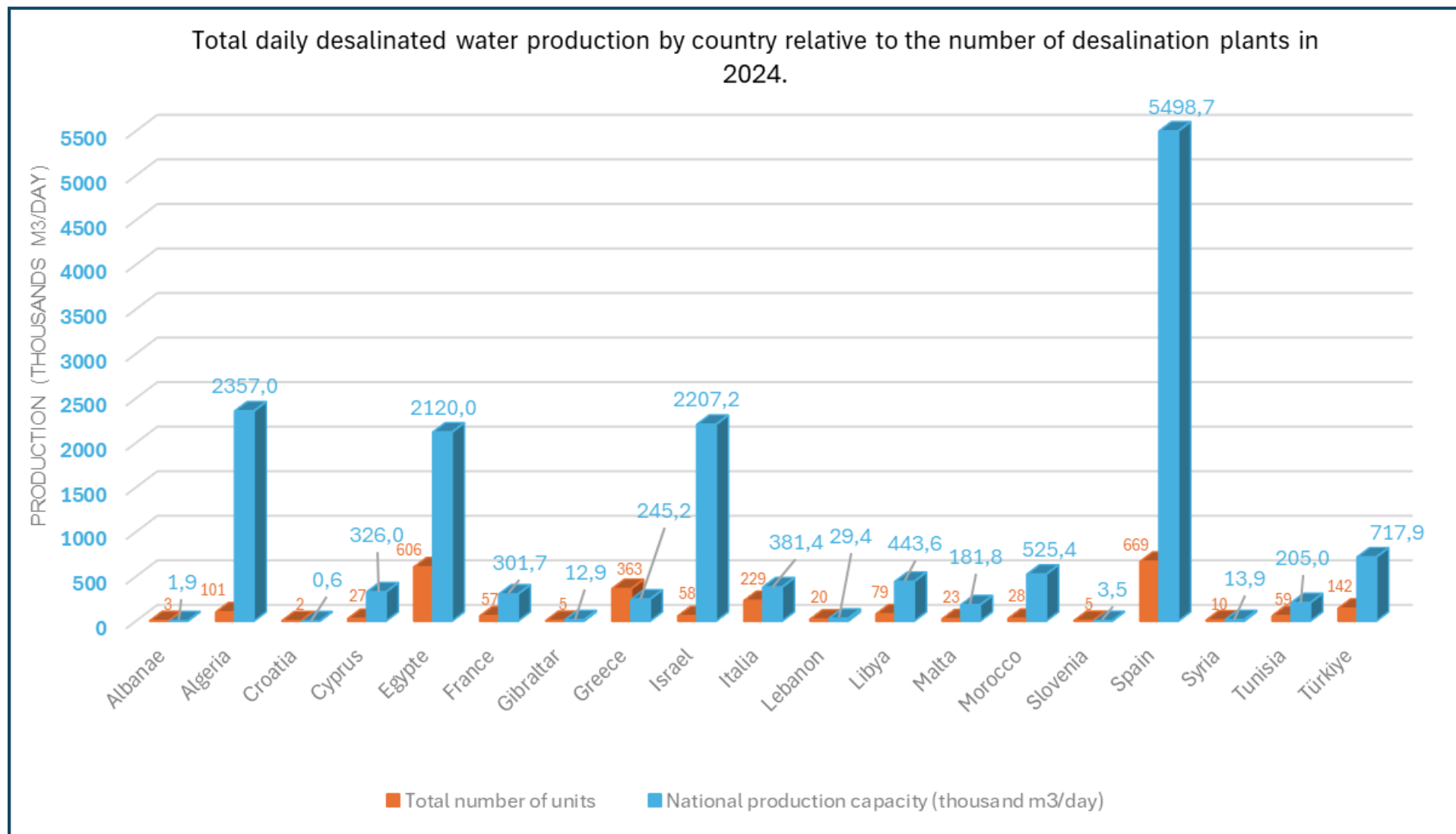
# Key results on desalination sector (from 2024 studies)



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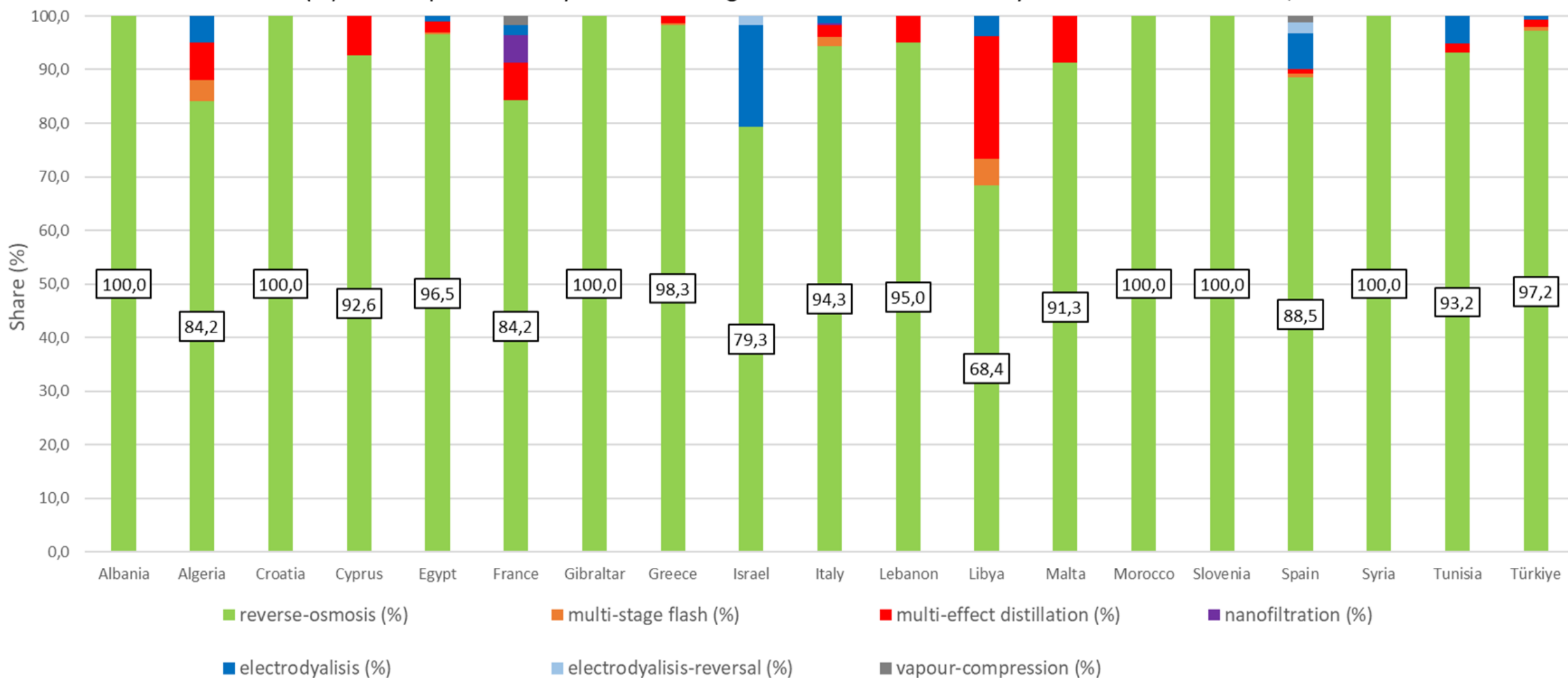
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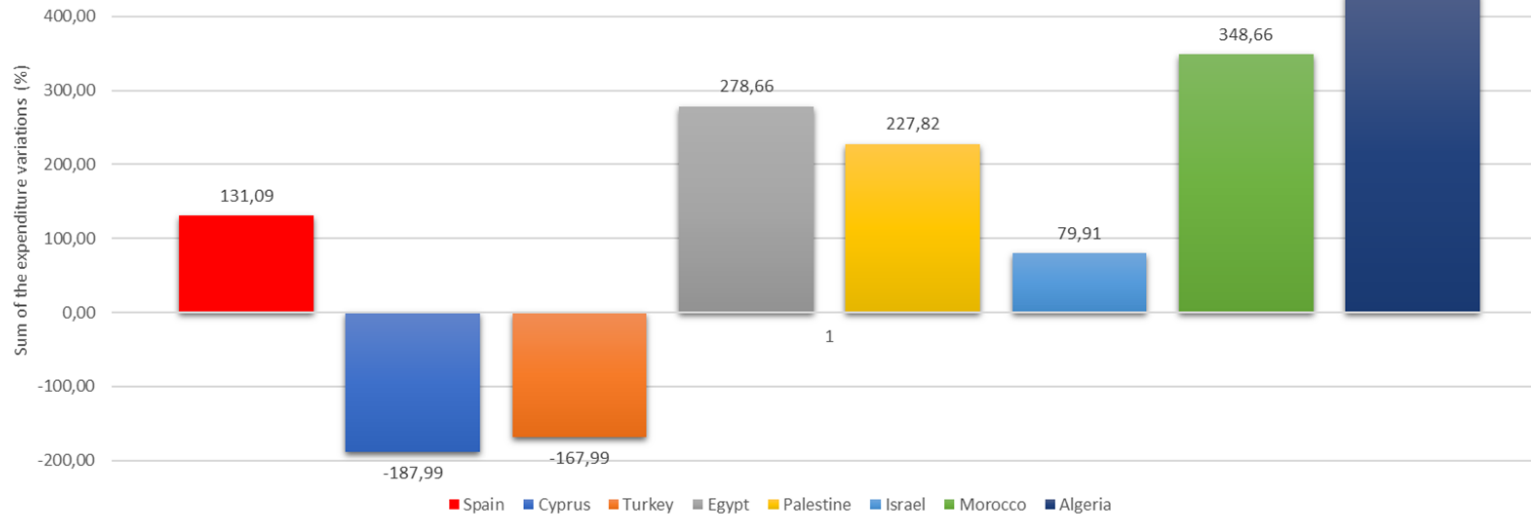
Share (%) of each production system technologies for desalination activity sector at national scales, in 2024.



# Key results on desalination sector (from 2024 studies)



Comparison of the Capex expenditure variation sums until 2027 for several Mediterranean countries

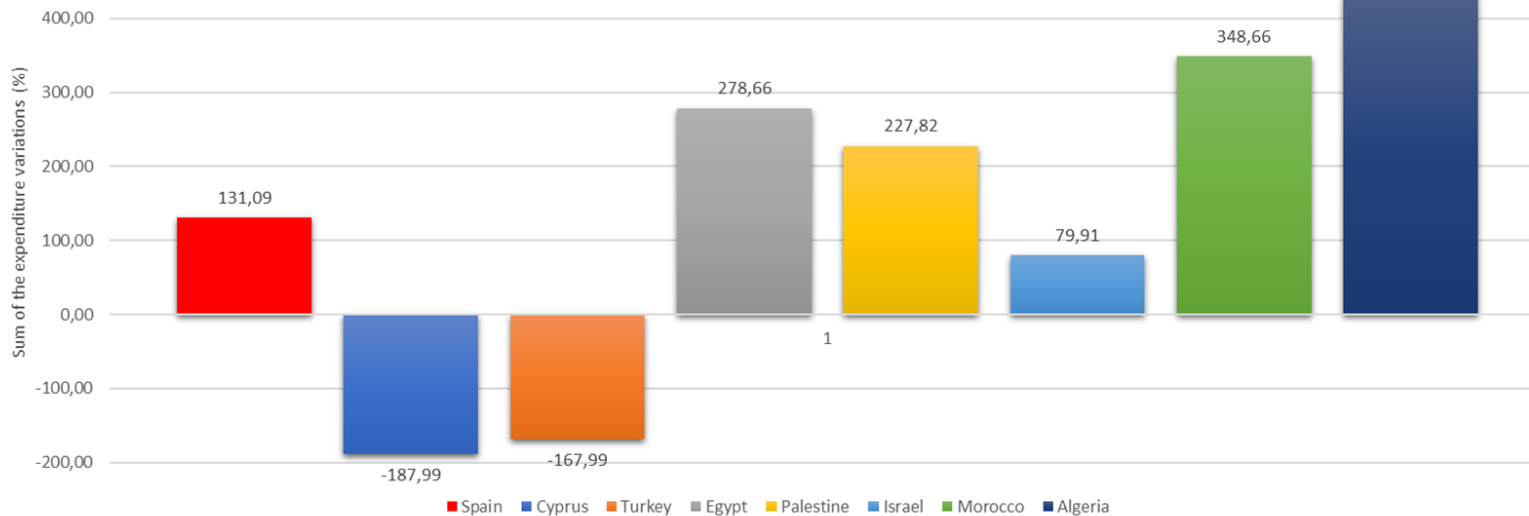


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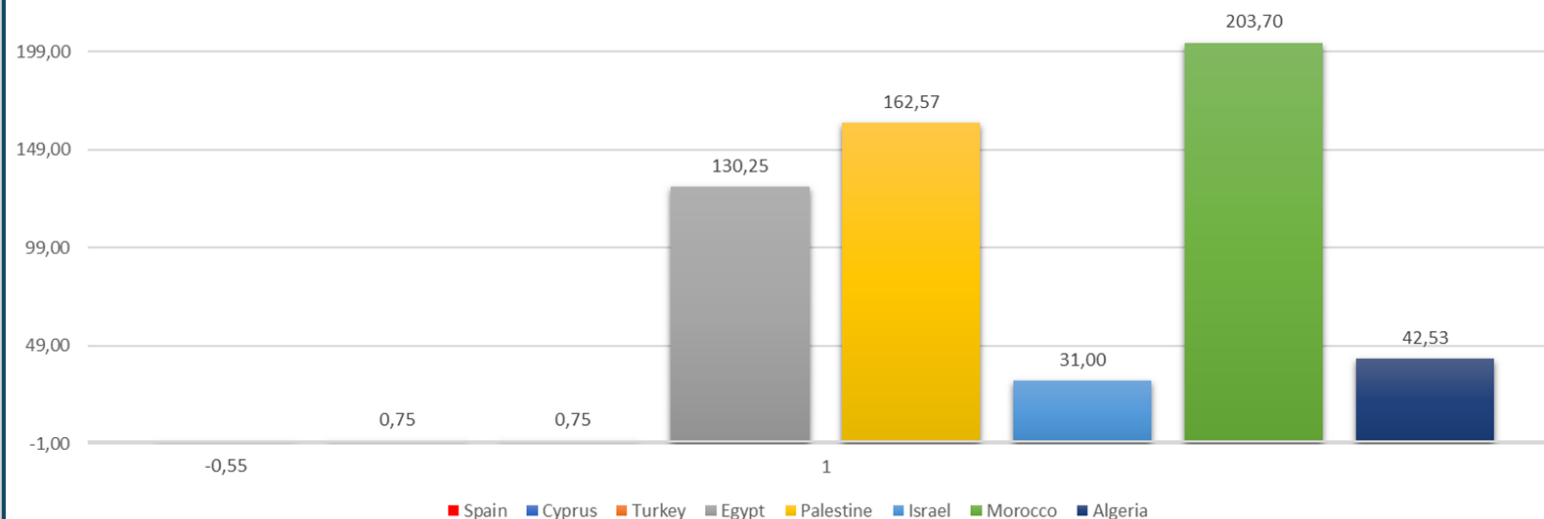


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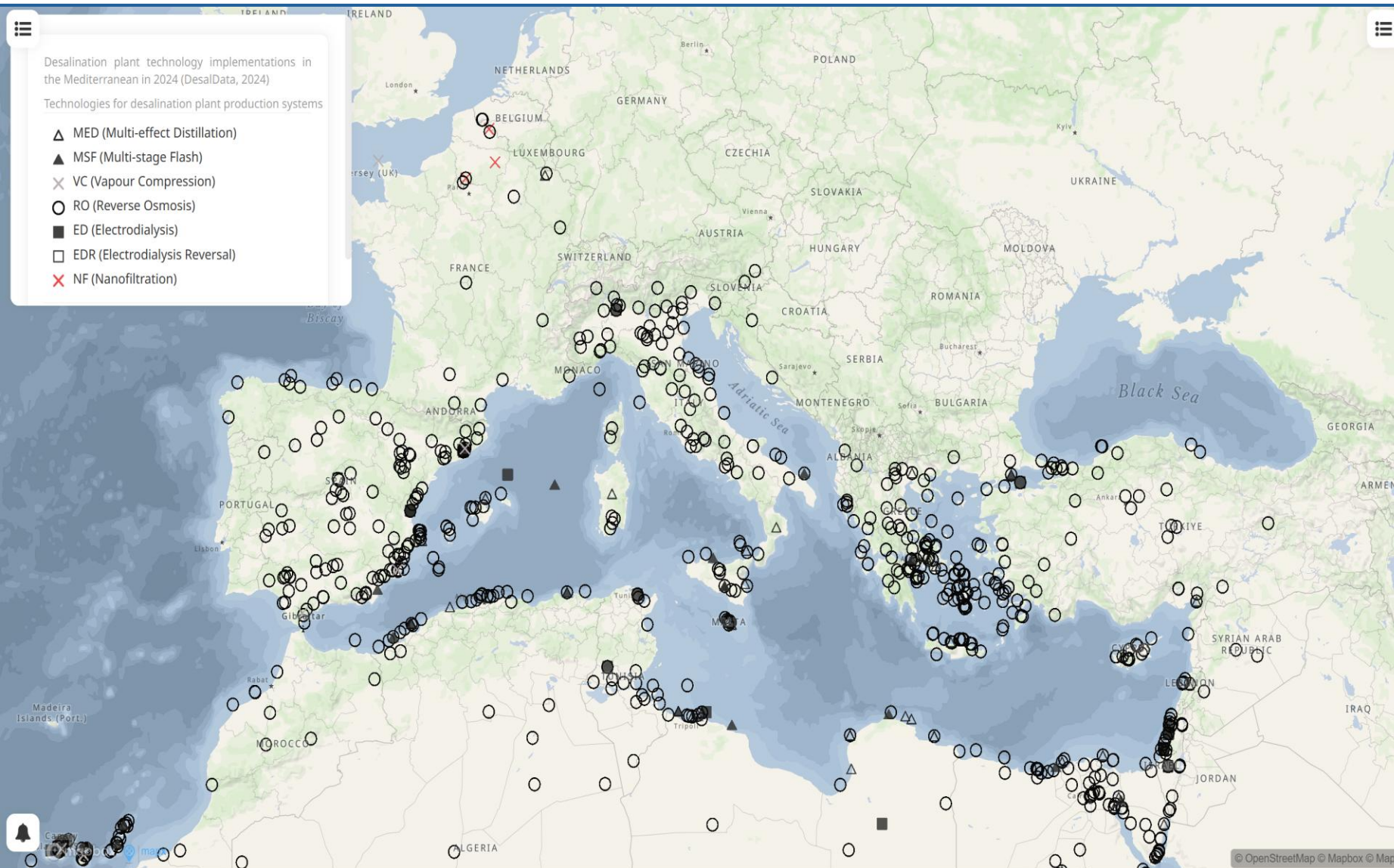
Comparison of the Capex expenditure variation sums until 2027 for several Mediterranean countries



Comparison of the Opex expenditure variation sums until 2027 for several Mediterranean countries

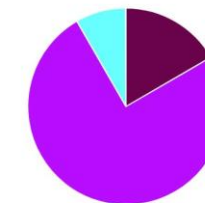


# Key results on desalination sector (from 2024 studies)



Customer types comparison 2023

Morocco

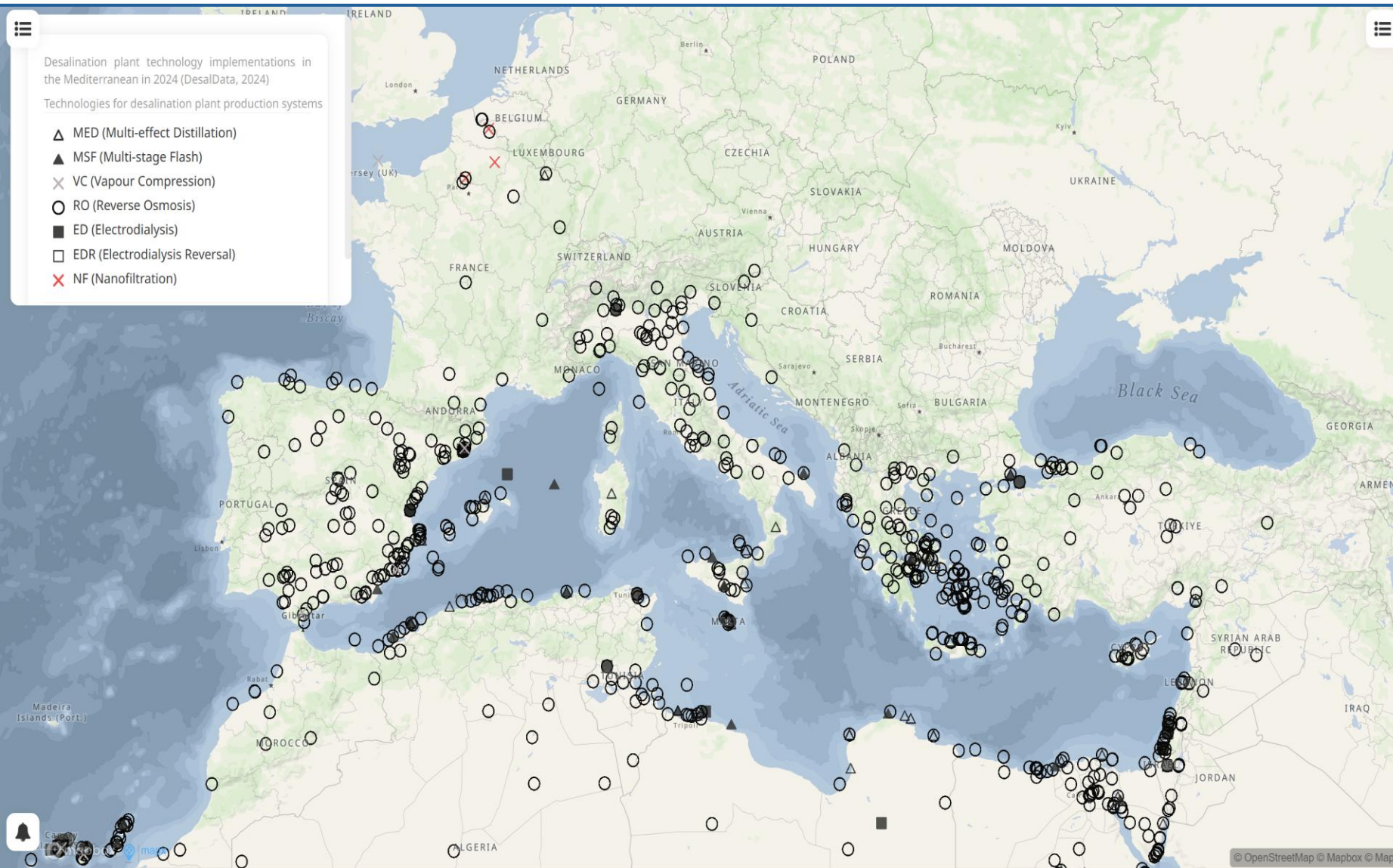


- Industry (TDS < 10ppm)
- Municipalities as drinking water (TDS 10ppm - < 1000ppm)
- Irrigation (TDS < 1000ppm)
- Tourist facilities as drinking water (TDS 10ppm - < 1000ppm)
- Discharge (TDS < 10ppm)

Source: World Bank.

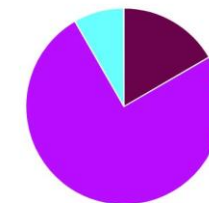


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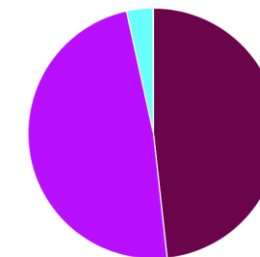


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Comparison of feeding water sources at national scale, in 2024.

Morocco

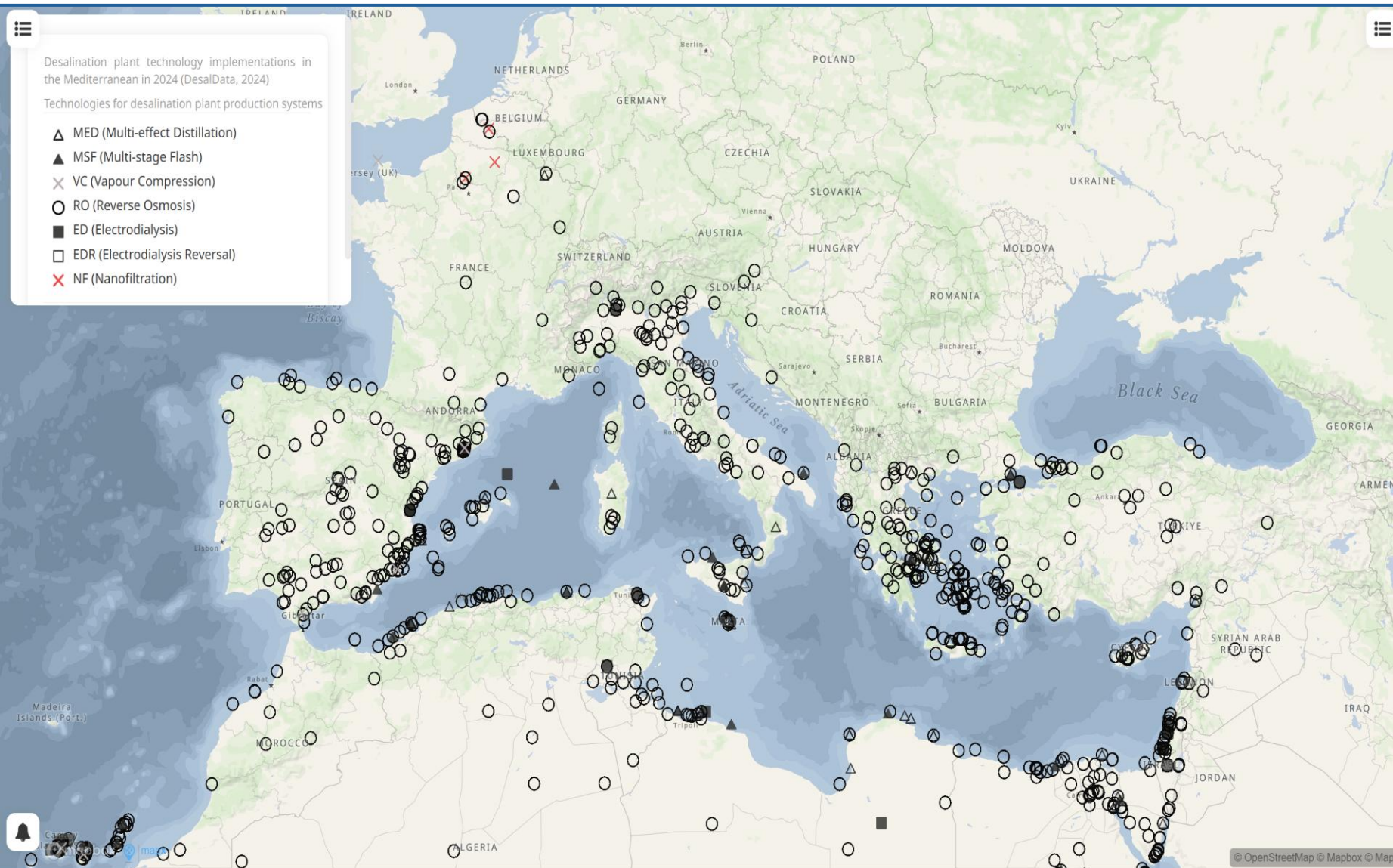


- seawaters
- brine
- brackishwaters
- river\_waters
- pure\_water
- wastewaters

Source: Desaldata.

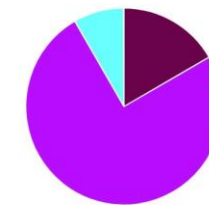


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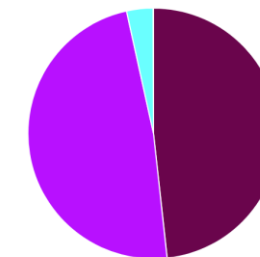


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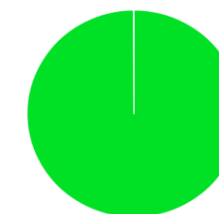


- seawaters
- brackishwaters
- river\_waters
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Source: Desaldata.

Proportion of each desalination production system at national scale in 2024

Morocco



- reverse-osmosis
- multi-stage-flash
- multi-effect-distillation
- nanofiltration
- electrodiyalis
- electrodiyalis-reversal
- vapour-compression

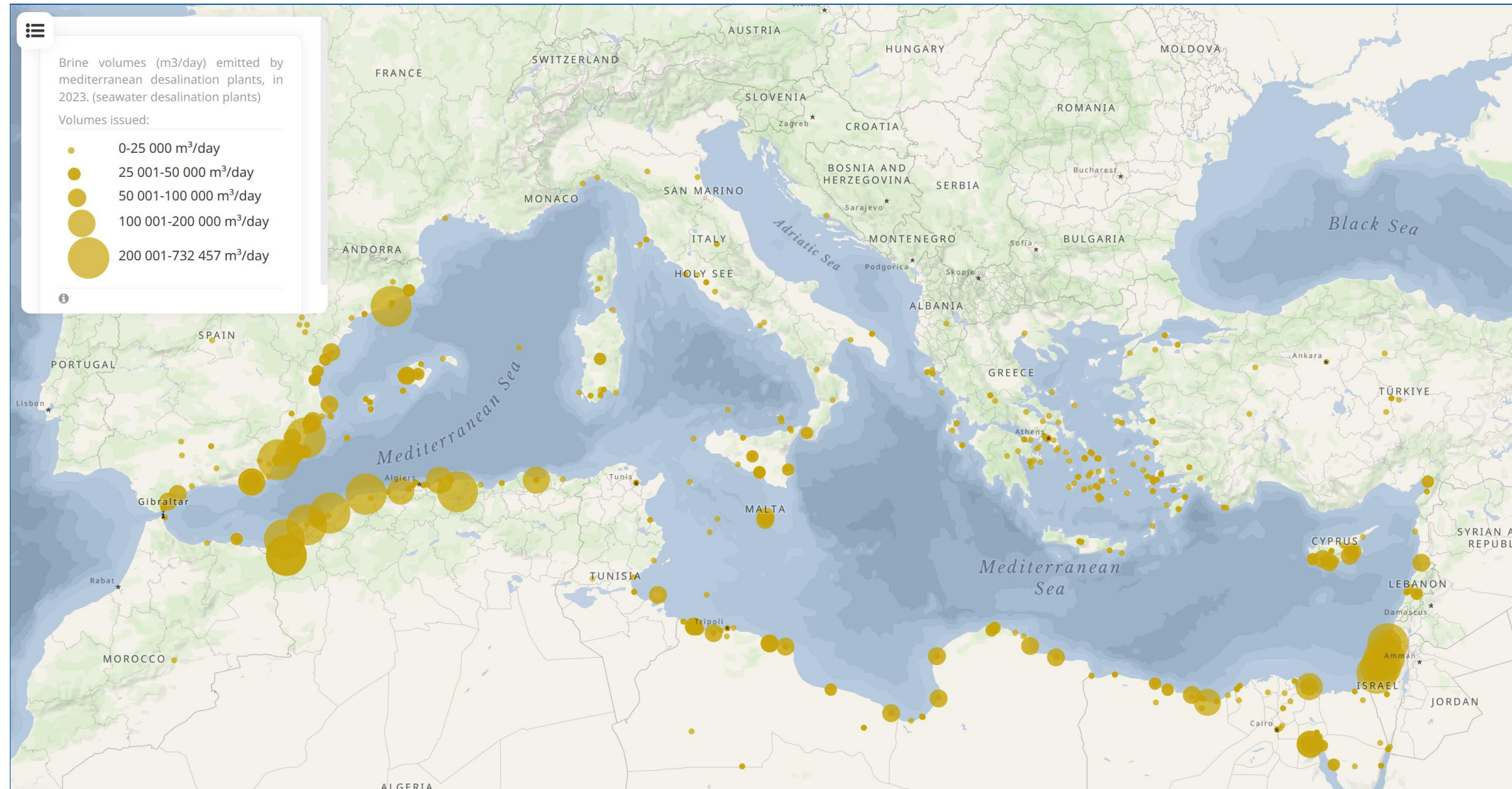
Source: Desaldata, 2024.



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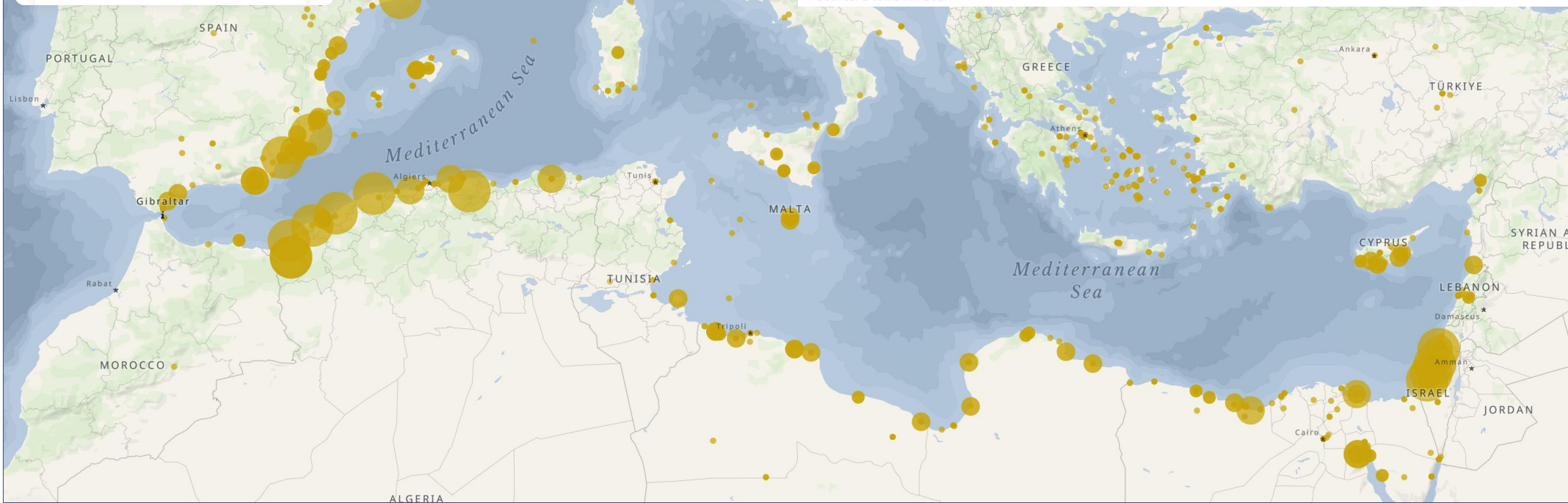
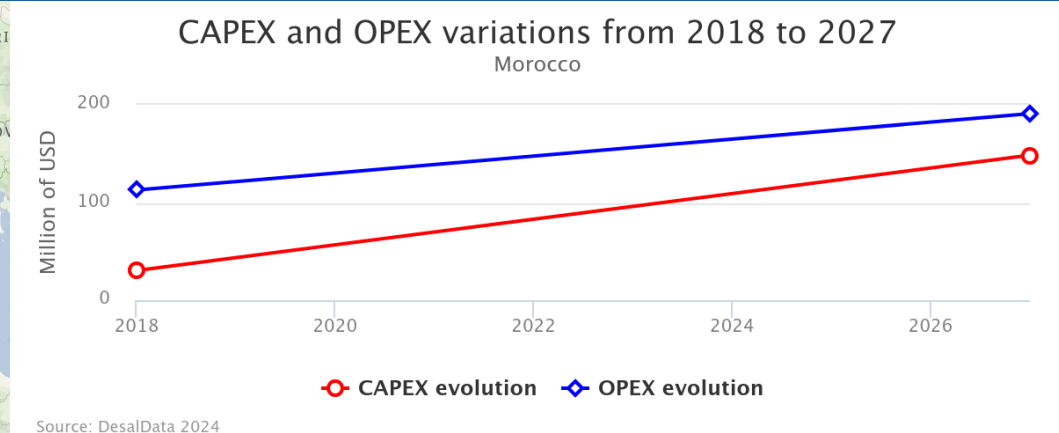
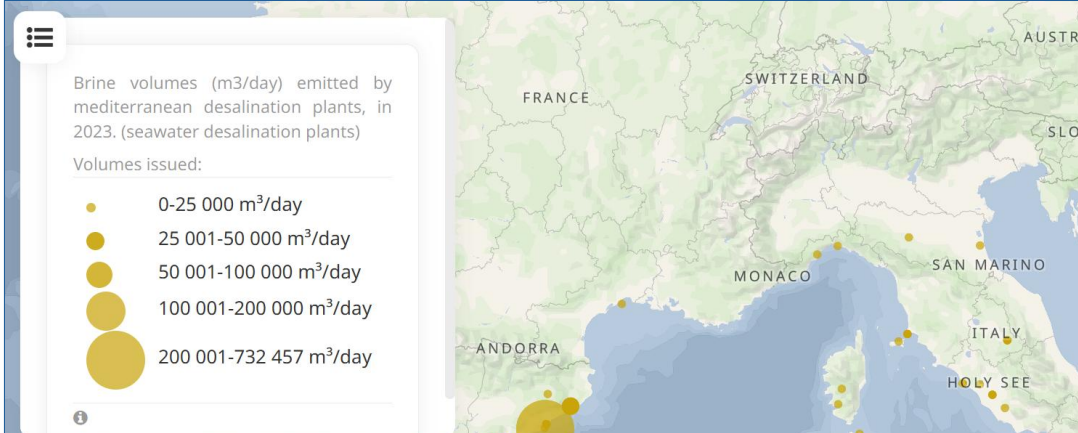
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# Call for scientific papers (2025)

## In-depth analysis of the desalination sector in the Mediterranean: a path towards sustainable non-conventional water resources in a Mediterranean basin under stress from the impacts of climate change and the scarcity of water resources ?

1. Examining the Connections Between **Water Resource Scarcity**, Desalination and Climate Change: A Study **Supporting SDG 6 Implementation** – *Salah Eddine Sari Hassoun, Seyf Eddine Benbekhti, Hadjer Boulila*
2. Sustainability in Desalination: **Addressing Risks and Mitigation Strategies** Across the Mediterranean Region – *Mohammed N. Assaf*
3. Strengthening the **Sustainability and Resilience** of the Desalination Sector in the Mediterranean – *Firas Marsit*
4. **Assessing the Economic Viability** of Desalination in Selected Mediterranean Countries: How Can It Contribute to a Sustainable Future? – *Samir Maliki, Nathalie Hilmi, Mourad Kertous, Abdelhadi Benghalem*
5. **Balancing Access and Sustainability**: Assessing the **Economic, Social, and Environmental** Impacts of Water Desalination in Algeria – *Mourad Kertous, Samir Maliki, Ouieme Sour*
6. Can **Desalinated Water Drive Agricultural Growth** in Algeria? A Feasibility Study for Economic and Sustainable Development – *Hadjer Boulila, Seyf Eddine Benbekhti, Salah Eddine Sari Hassoun*
7. **Governance and Executive Regulatory Tools** for a More Sustainable Desalination Industry in Algeria – *Najet Aroua*
8. **Improving Governance and Regulatory Tools** for More Sustainable Water Management in Algeria – *Bouznad Imad Eddine*
9. Towards a **'One Health' Approach** to Sustainable Desalination: Reducing Environmental and Social Impacts – *Maha El Mahdaoui*
10. **Inclusive Waters**: Assessing the **Socioeconomic Impact** of Desalination and Inclusive Decision-Making in the Mediterranean – *Widad Metajer & Ykhlef Soumia*



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### Energy & Climate

- Mediterranean countries **must develop renewable energies and integrated water management** to achieve SDG-6
- Water-energy policies need to be adapted to each country while promoting regional collaboration and **cross-border energy networks**

### Economic Viability

- Sector heavily influenced **by demographic, climatic, and demand variables**
- **Circular economy models** (desalination-agriculture) offer significant economic and productivity gains
- Need for **sustainable economic models** throughout the entire **life cycle of facilities**

### Governance and Planification

- Integrate desalination plants into **land-use planning tools**.
- Strengthen **local governance of water resource management**.
- **Reduce spatial fragmentation** between desalination and other coastal activities.
- **Deploy predictive tools** that analyze the entire system: desalination, water regime, and demographic trends.

### Integrated approaches

- The impacts of **desalination go beyond supply**: marine biodiversity, public health, trust in governance, and social equity (one health approach)
- The current **sector disconnects between the pillars of sustainable development** requires the systematic integration of social equity
- **Need for a holistic approach** that reveals the underlying risks and associated benefits

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### Highlights on Morocco case study (based on specific papers)

Country	% Think Desal is a Good Solution	% Willing to Pay More	% Trust Authorities	% Concerned about Health	% Say Public is Informed
Morocco	87%	10%	20%	53%	15%

#### Key Challenges

High cost of desalinated water; public resistance to privatization; ecological impact on fisheries

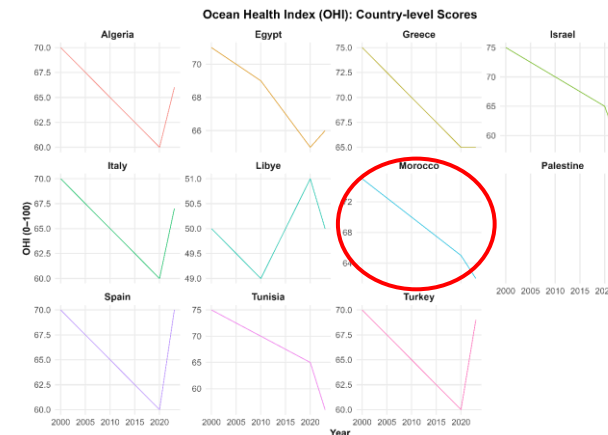
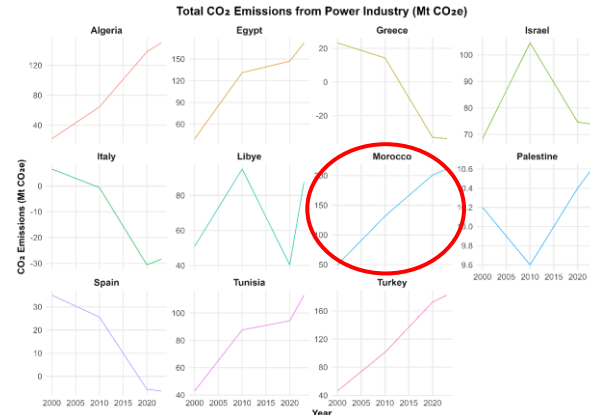
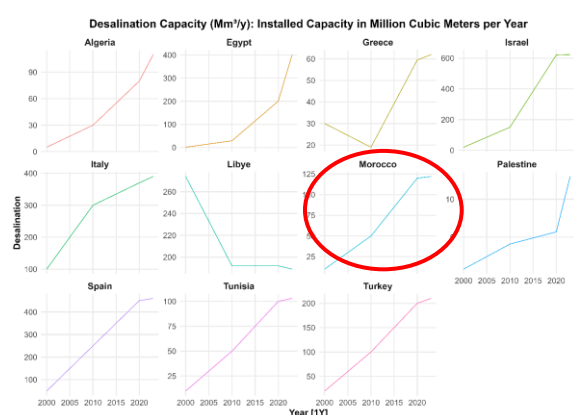
#### Opportunities & Progress

Use of PPPs; major scaling targets; renewable energy integration

#### Integration of One Health Principles

Guidelines aligned with Barcelona Convention; renewable-powered plants

Social perceptions, opportunities & challenges (M.mahdaoui, 2025)



Socio-economic and environmental impacts (S.Maliki et al., 2025)



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Thank you!

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www.worldwatercongress.com

