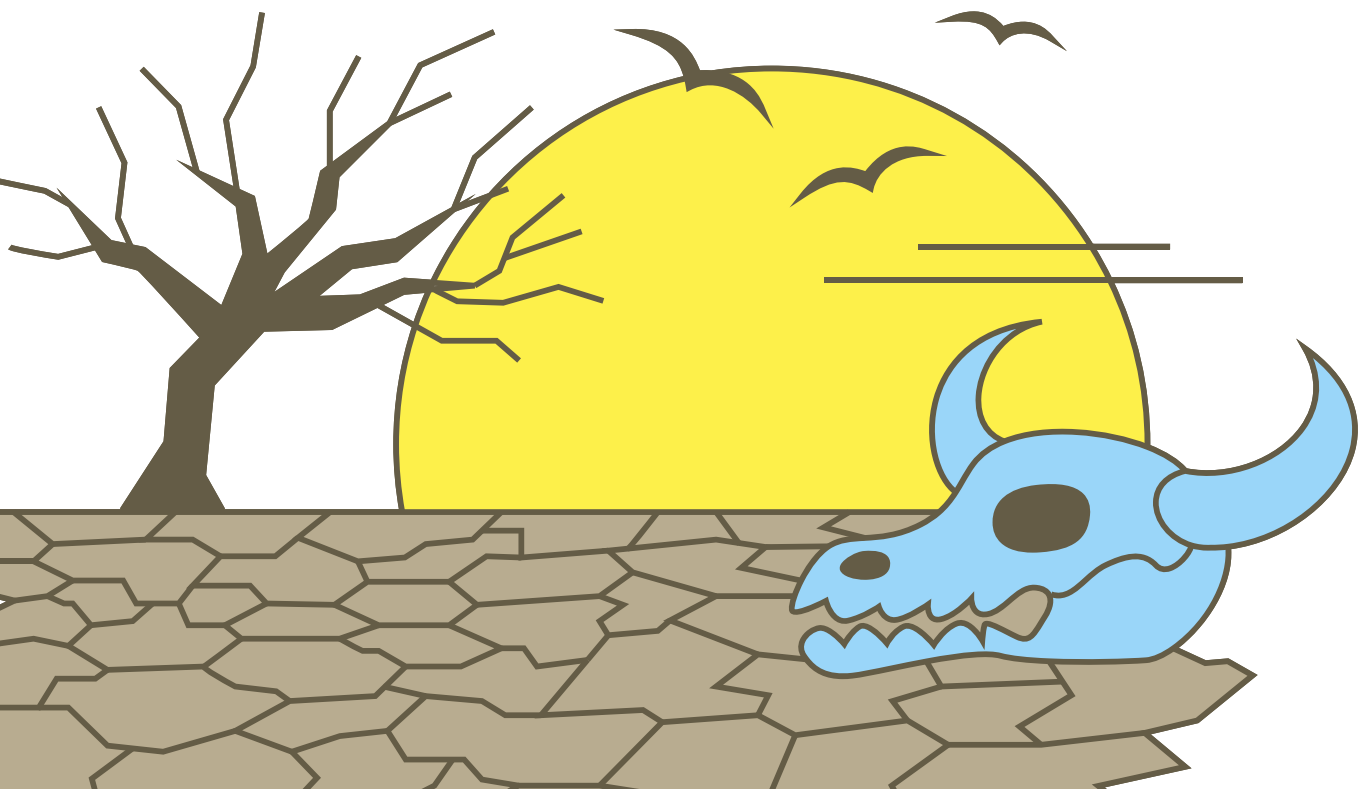


Water Scarcity & Sustainable Water Management in Morocco

Environmental Economics – ECON 2675 –
Hayaa Al-Mannai

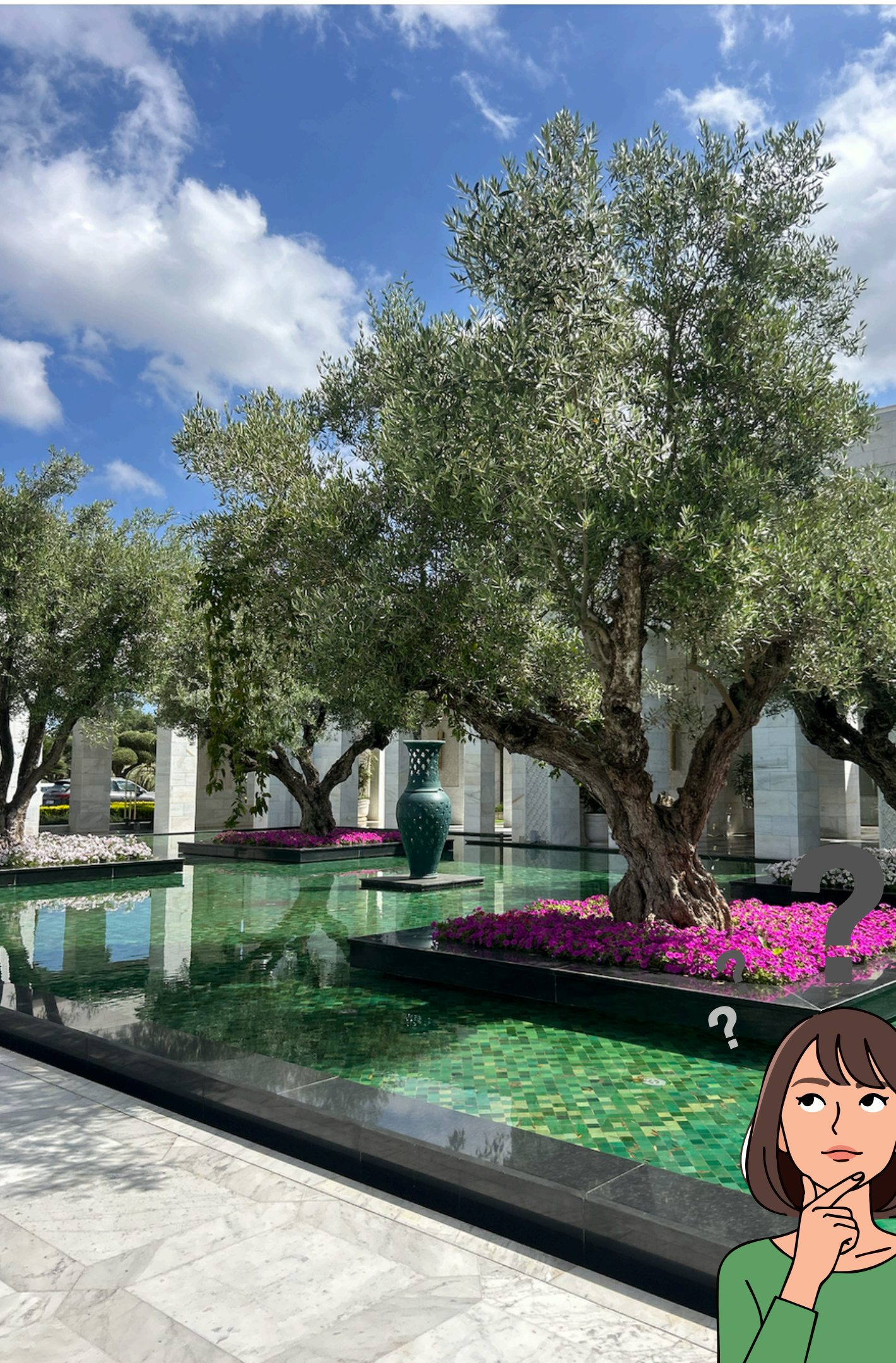


Understanding Morocco's Landscape

Morocco is an environmentally diverse country in North Africa:

- Atlantic & Mediterranean coasts
- Atlas Mountains
- Agricultural plains
- Semi arid and arid regions
- Water availability declined from approximately 2600 m³ per person to around 600 m³ today
- The UN defines water scarcity at below 1000 m³ and Morocco is below that





Causes of Water Scarcity in Morocco

1. Uneven Rainfall Distribution - Morocco still receives rain and occasionally experiences floods, but rainfall is irregular and unevenly distributed across time and regions.
2. Recurrent Droughts - Morocco has experienced repeated drought years and declining water availability over time.
3. Groundwater Overexploitation - Water demand often exceeds recharge in some aquifers due to agriculture and population growth.
4. Agricultural Water Demand - Agriculture consumes most water resources in Morocco, increasing pressure on supply.

Morocco's Water Paradox: Floods and Scarcity

How can Morocco experience floods while remaining water stressed?

Floods do not automatically solve scarcity because:

- Floods are temporary events
- Water may run off instead of being stored
- Demand remains high
- Groundwater remains depleted
- Water security depends on long-term availability
- Floods do not necessarily indicate water abundance



Environmental Economics Perspective

Scarcity

- Water is a limited resource in Morocco.
- Greater use today may reduce future availability.

Dynamic Efficiency

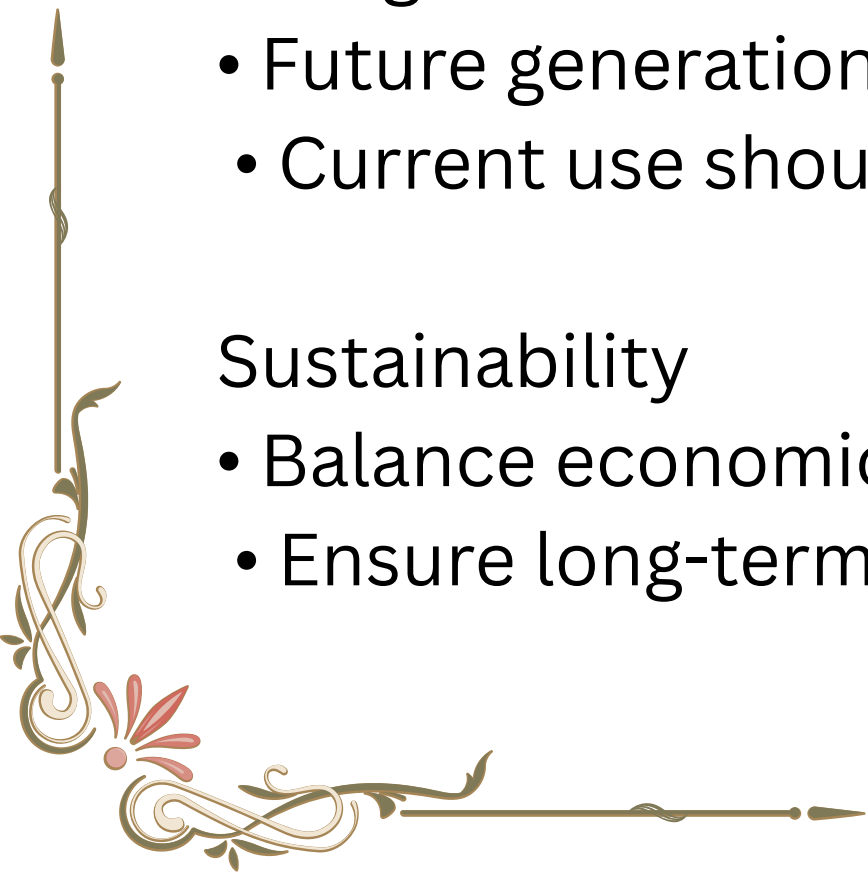
- Water should be managed efficiently over time.
- Morocco must balance present use with future water security.

Intergenerational Equity

- Future generations should also have access to water resources.
- Current use should not create future shortages.

Sustainability

- Balance economic development with environmental protection.
- Ensure long-term water availability.





Economic and Social Impacts

Agriculture

- Water scarcity reduces irrigation and crop productivity.
- Lower water availability affects agricultural output.

Rural Communities

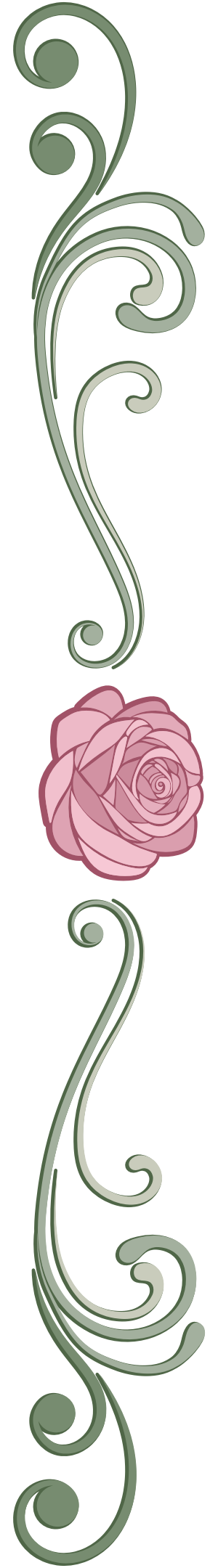
- Many rural communities depend on agriculture.
- Water shortages increase economic vulnerability.

Food Security

- Reduced water availability affects agricultural production.
- Food systems may face greater pressure.

Economy

- Water stress affects water-dependent sectors.
- Long-term shortages may constrain economic growth.



What is Morocco doing?

Desalination

- Expanding desalination to increase freshwater supply.
- Improves long-term water security.

Dams and Reservoirs

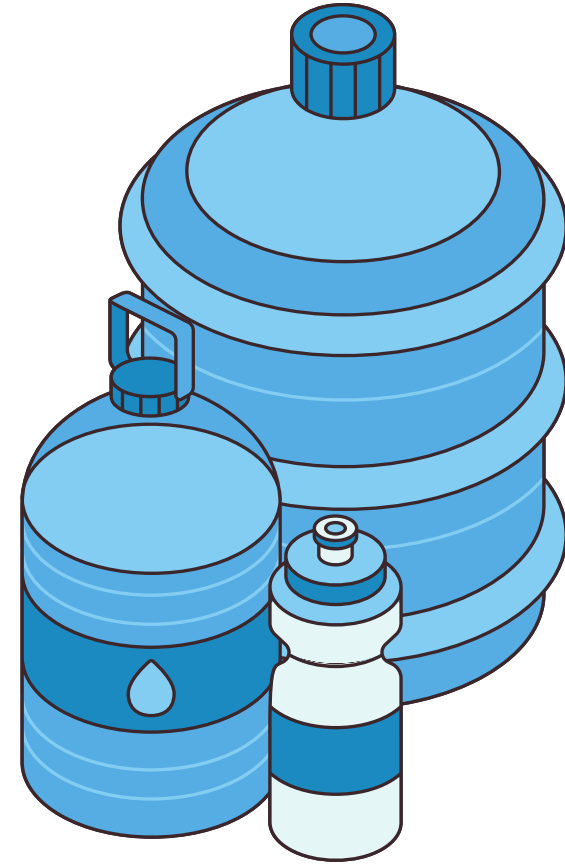
- Increasing water storage capacity.
- Helps capture rainfall and floodwater.

Water Transfer Projects

- Redistribute water between regions.
- Address uneven water availability.

Infrastructure Investment

- Investing in water management systems.
- Supports long-term sustainability.



Sustainable Water Management

According to MIPA, Morocco should focus not only on increasing water supply but also improving water management.

Efficient Irrigation

- Increase agricultural output while using less water.

Water Reallocation

- Improve water distribution across sectors and regions.

Better Governance

- Strengthen long-term planning and water management.

“Morocco has to think about water reallocation strategies.”
(MIPA Institute)



Challenges and Tradeoffs

Desalination

Benefits:

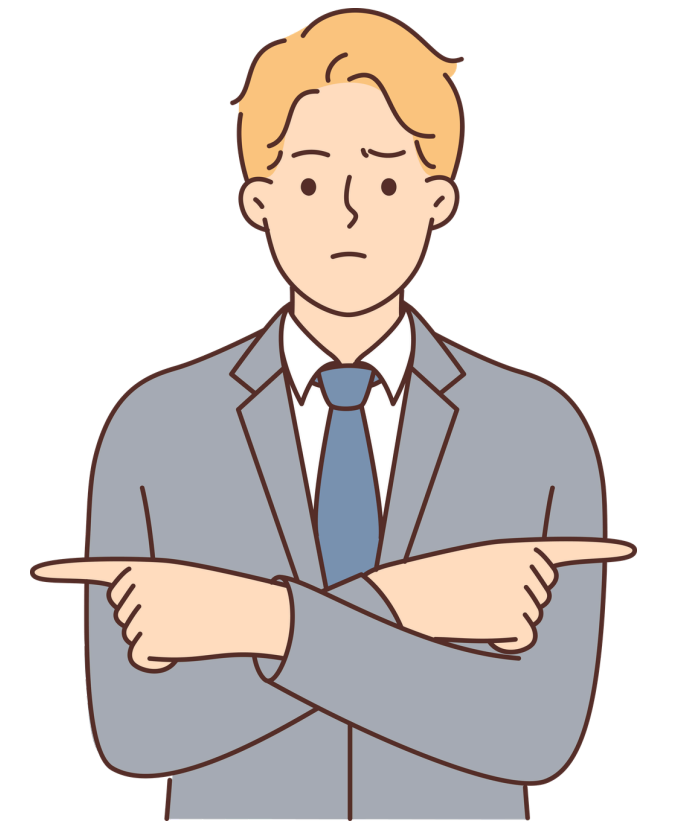
- Increases freshwater supply
- Improves water security

Challenges:

- High costs
- Energy intensive
- Potential environmental impacts

From an Environmental Economics Perspective

- Water solutions involve tradeoffs between costs and benefits.
- Policies should balance water security with sustainability.





My personal reflection

- During my recent visit to Morocco, I did not personally feel the effects of water scarcity.
- Water infrastructure may reduce the immediate effects experienced by people.
- Infrastructure manages scarcity rather than eliminating it.
- Agricultural demand and groundwater depletion continue to pressure water resources.
- Morocco's case shows that water scarcity is also about management and sustainability.

To conclude

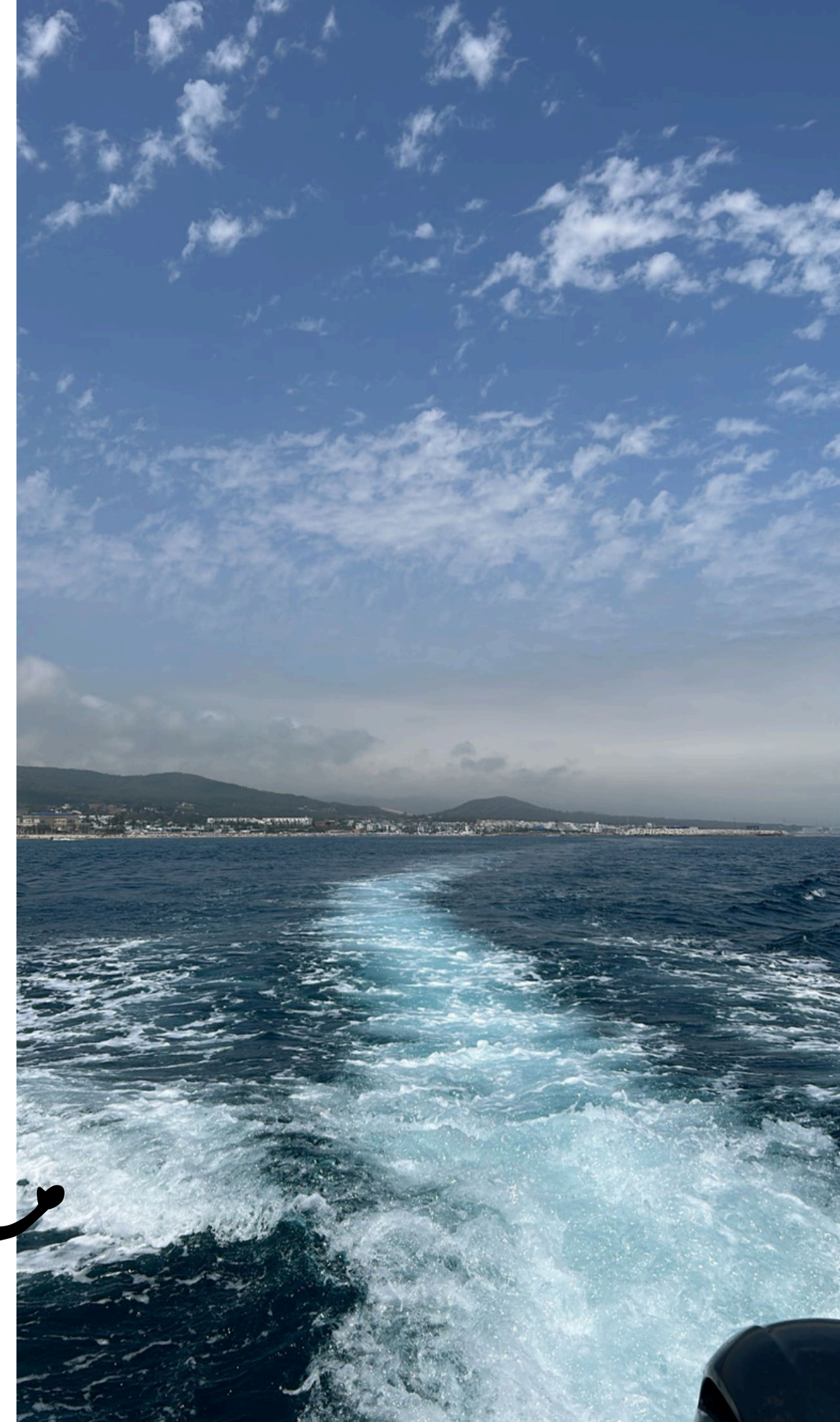
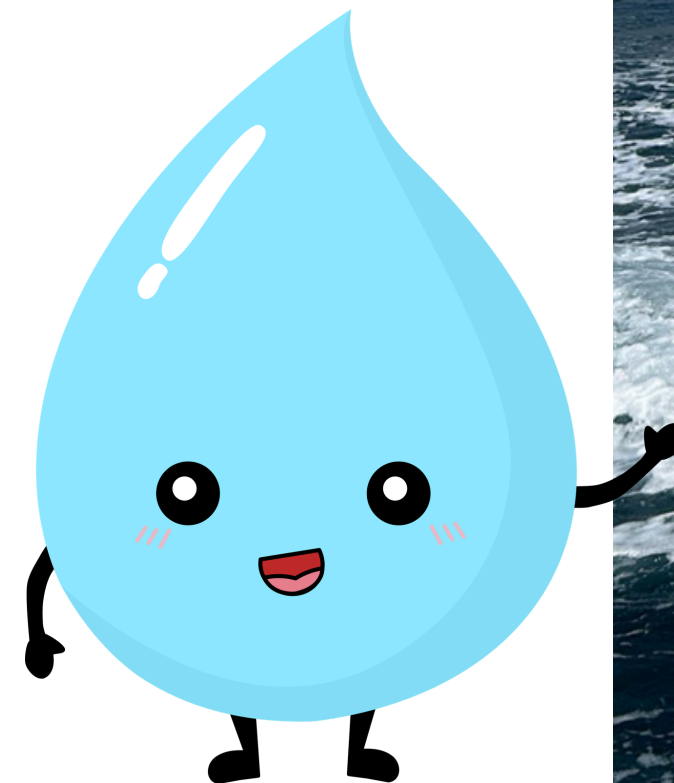
- Morocco experiences both floods and water scarcity.
- Water security depends on long-term availability and management, not temporary rainfall.

Main drivers:

- Droughts
- Agricultural demand
- Groundwater depletion
- Rising water demand

Morocco's response:

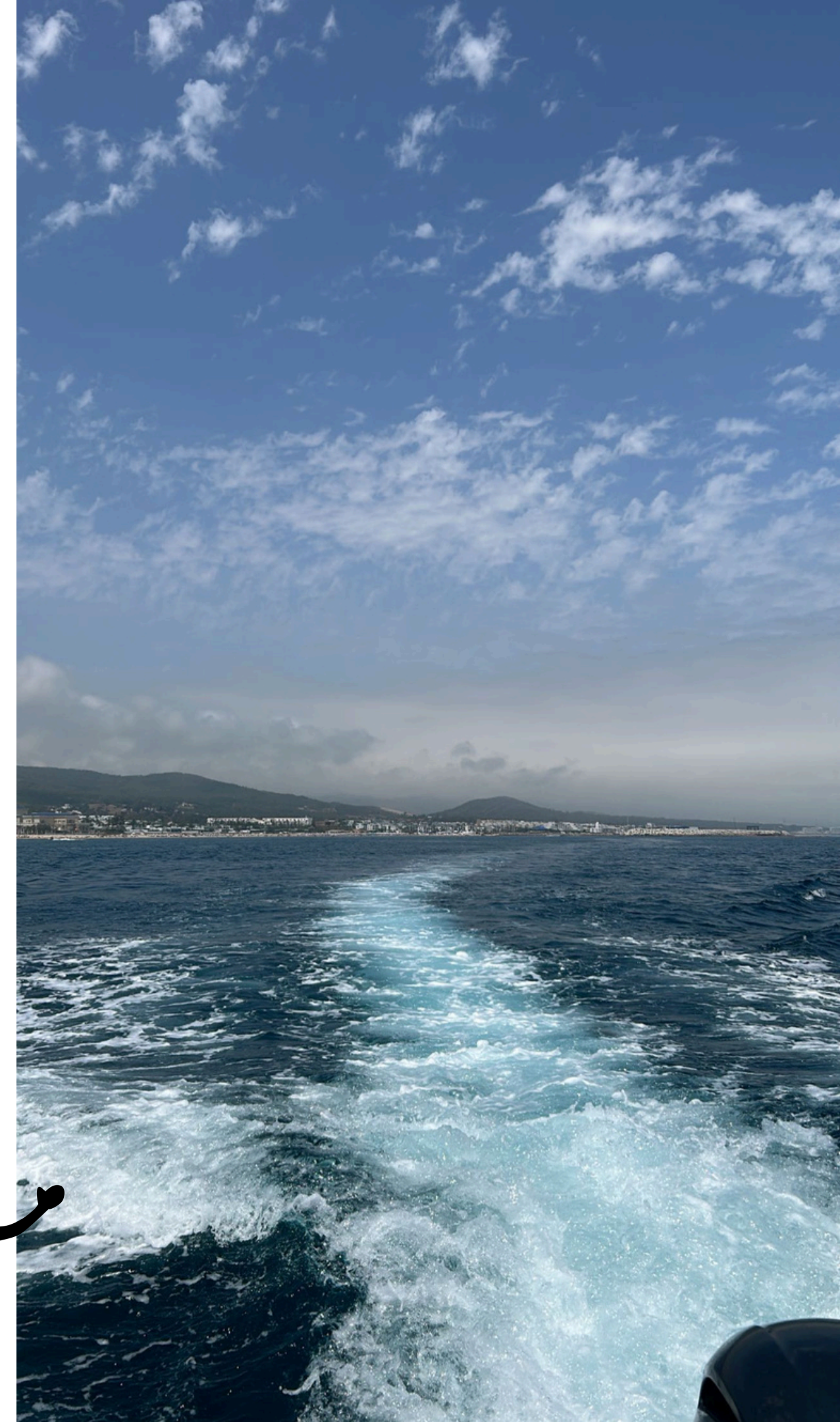
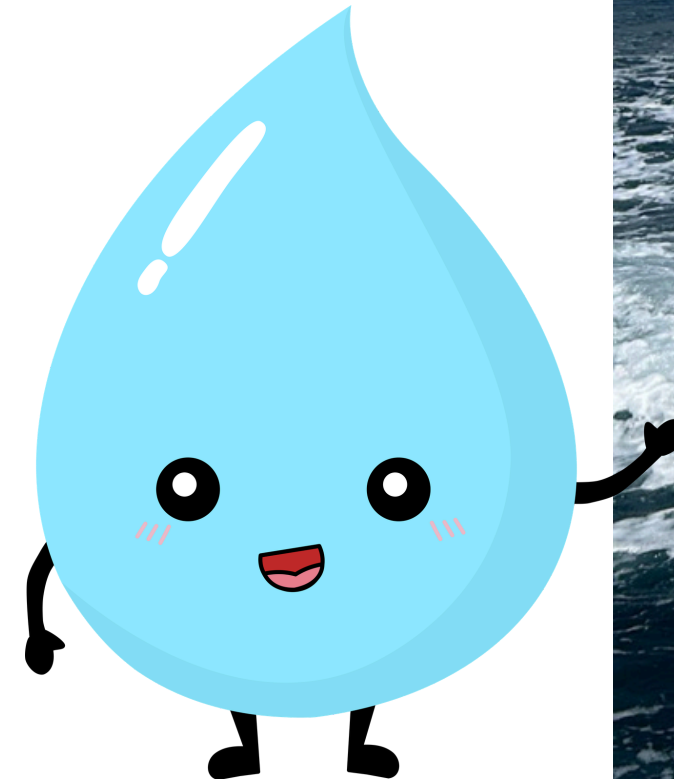
- Desalination
- Dams and reservoirs
- Sustainable water management



To conclude

قيمة الماء لا تُعرف إلا عند جفاف البئر

“The value of water is only known when
the well runs dry.”



Works cited

- “MIPA Institute – Water Scarcity in Morocco.” MIPA Institute, <https://mipa.institute/?p=8882&lang=en>. Accessed 20 May 2026.
- Water Scarcity in Morocco: Analysis of Key Water Challenges. World Bank, <https://openknowledge.worldbank.org/entities/publication/9927da44-a5c3-5d69-bc7f-f7610591f132>. Accessed 20 May 2026.
- Morocco National Water Security Program. World Bank, <https://documents1.worldbank.org/curated/en/099060723024517055/pdf/P179192045ef5f070b83c069916d70dcd3.pdf>. Accessed 20 May 2026.
- “Morocco Invests in Desalination and Waterways to Mitigate Drought.” Reuters, 13 June 2025, <https://www.reuters.com/sustainability/boards-policy-regulation/morocco-invests-desalination-waterways-mitigate-drought-2025-06-13/>. Accessed 20 May 2026.
- “Morocco Water.” International Trade Administration, U.S. Department of Commerce, <https://www.trade.gov/country-commercial-guides/morocco-water>. Accessed 20 May 2026.