Groundwater in the Arab Region: Making the invisible visible

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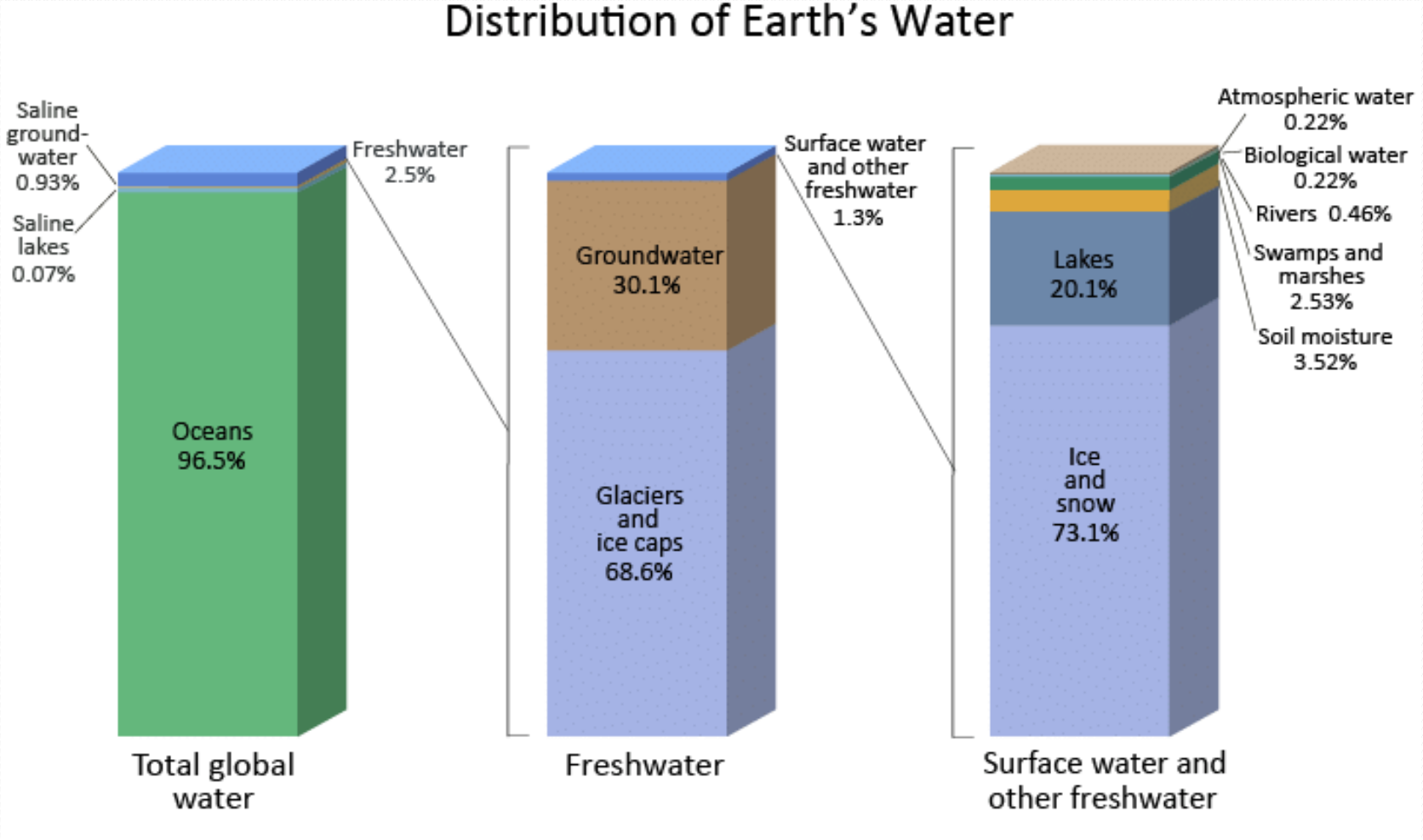
Overview

- Introduction
- Groundwater significance for the Arab region
- Groundwater use
- Groundwater stress
- Groundwater governance
- Transboundary aquifers management
- Disruptive technologies for groundwater management
- MAR to improve resilience
- Key messages

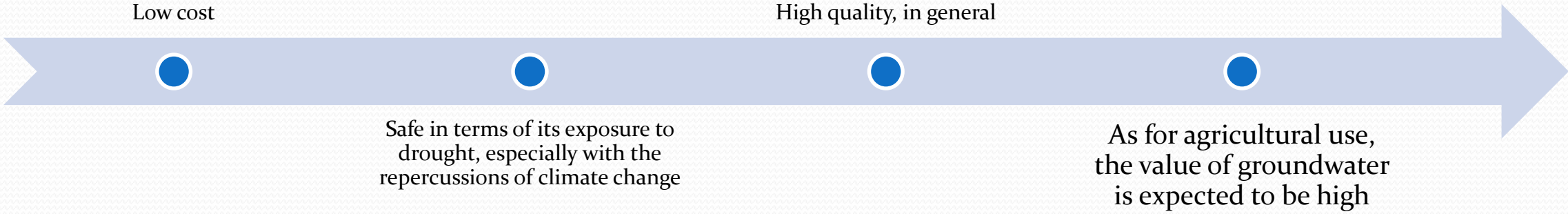
Introduction: Global Water Resources



Groundwater represents an important component of the world's total fresh water

Importance of Groundwater Worldwide

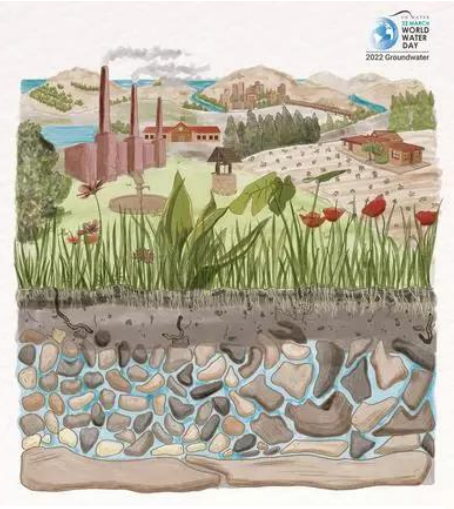
- **More than 2.5 billion people**, countless farmers and many industrial facilities depend on groundwater.
- About **50% of drinking water**, **40% of irrigation water**, and **35% of water for industries** globally are provided by groundwater.
- Significant social and economic benefits through the provision of groundwater supplies:



- The future use of groundwater will also be of vital importance to achieving the "Sustainable Development Goals" of the 2030 Development Agenda

Making the Invisible Visible:

- The World Water Day theme this year will be “Groundwater: Making the invisible visible”
- The groundwater year will end with a groundwater summit (7-8 December in Paris)
- Inform global platforms and foster regional consultations on groundwater.
- Provide a status update on groundwater resources in the region and major stresses and uses.
- Improve understanding of the importance of groundwater as a strategic resource in the region

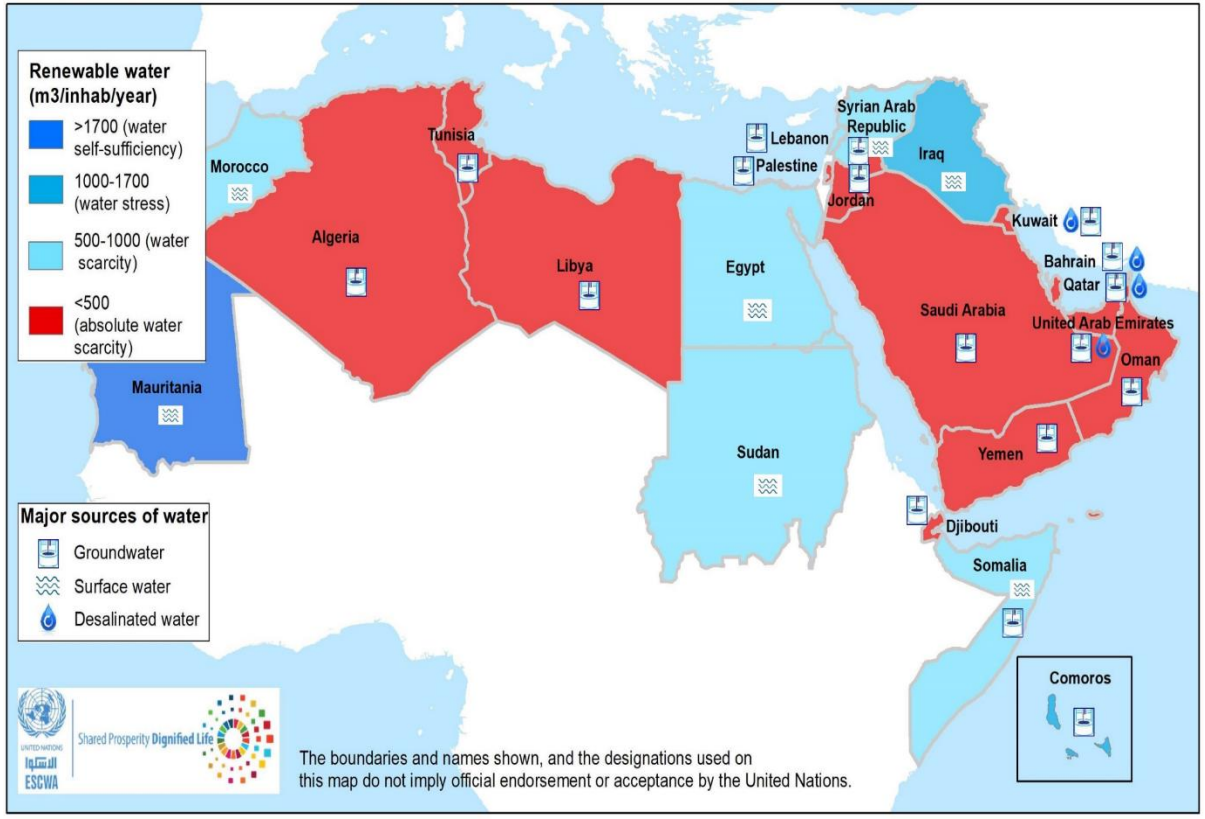


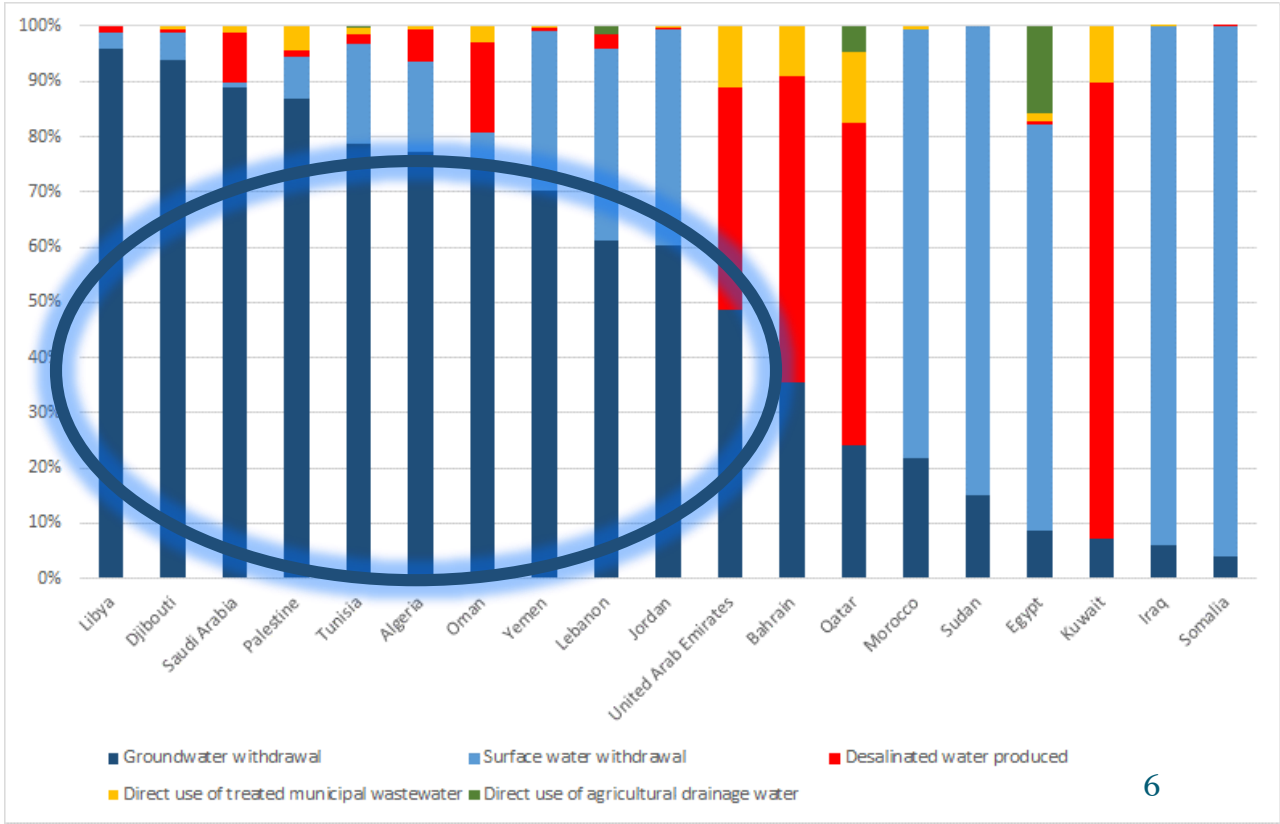
GROUNDWATER SUMMIT 2022

WATER ACTION DECADE 2018–2028

Groundwater Significance for the Arab Region

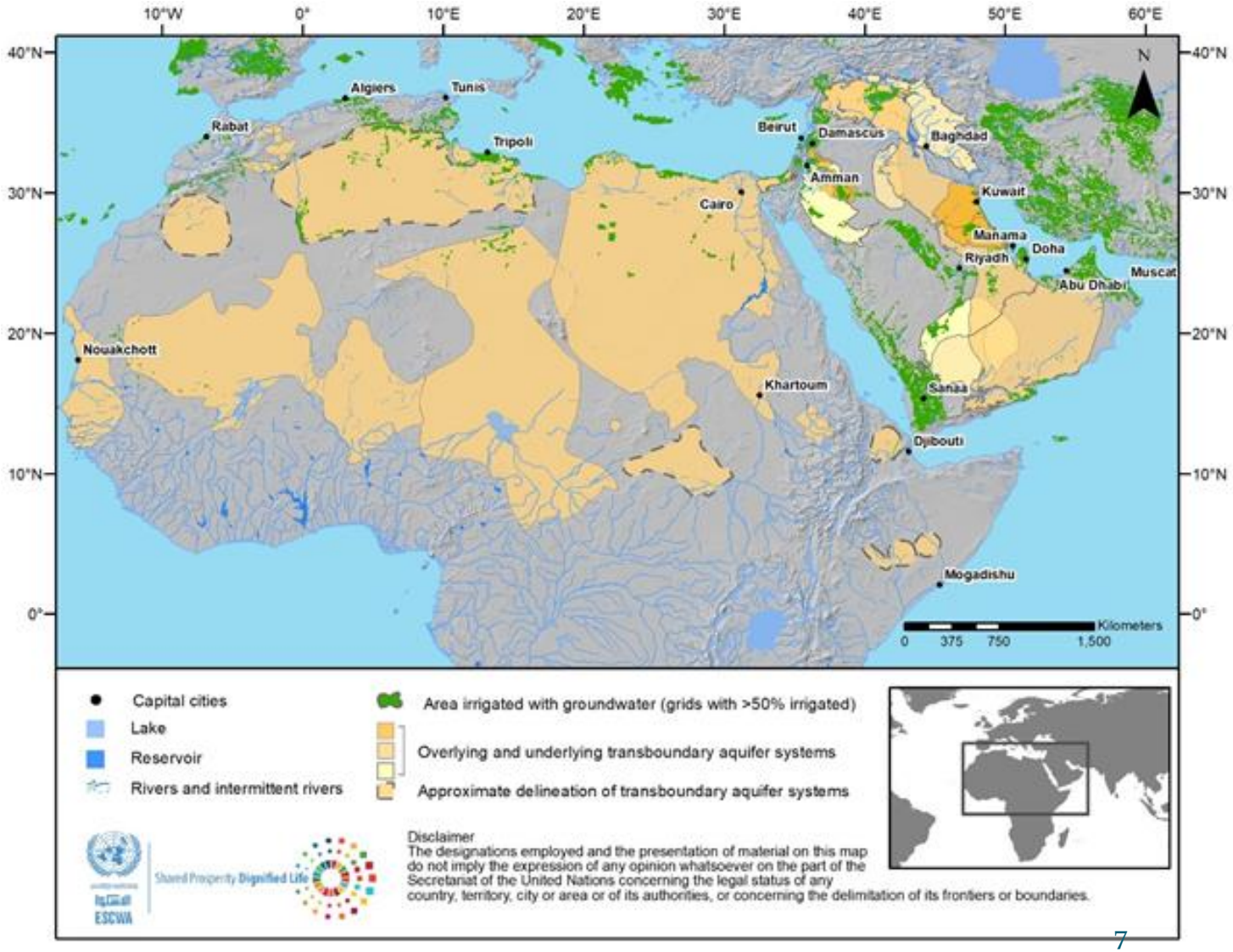
- The Arab region is one of the most water scarce regions in the world.
- More than half of the Arab States rely heavily on groundwater.





Cont., groundwater significance for the Arab region

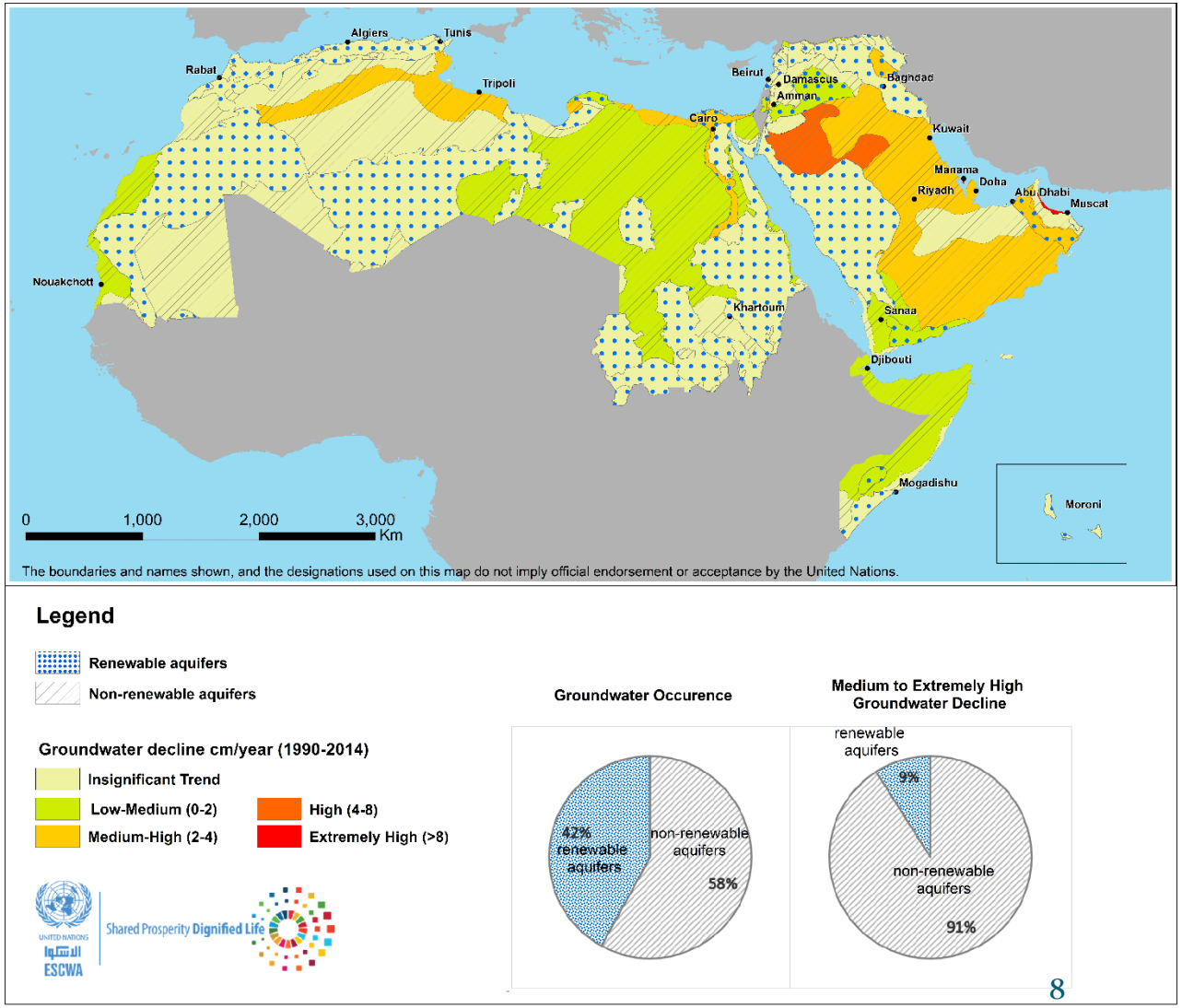
- There are 43 transboundary aquifers in the Arab region that constitute the main sources of water supply.
- Transboundary aquifers cover around 58% of the Arab region surface area.



Cont., groundwater significance for the Arab region

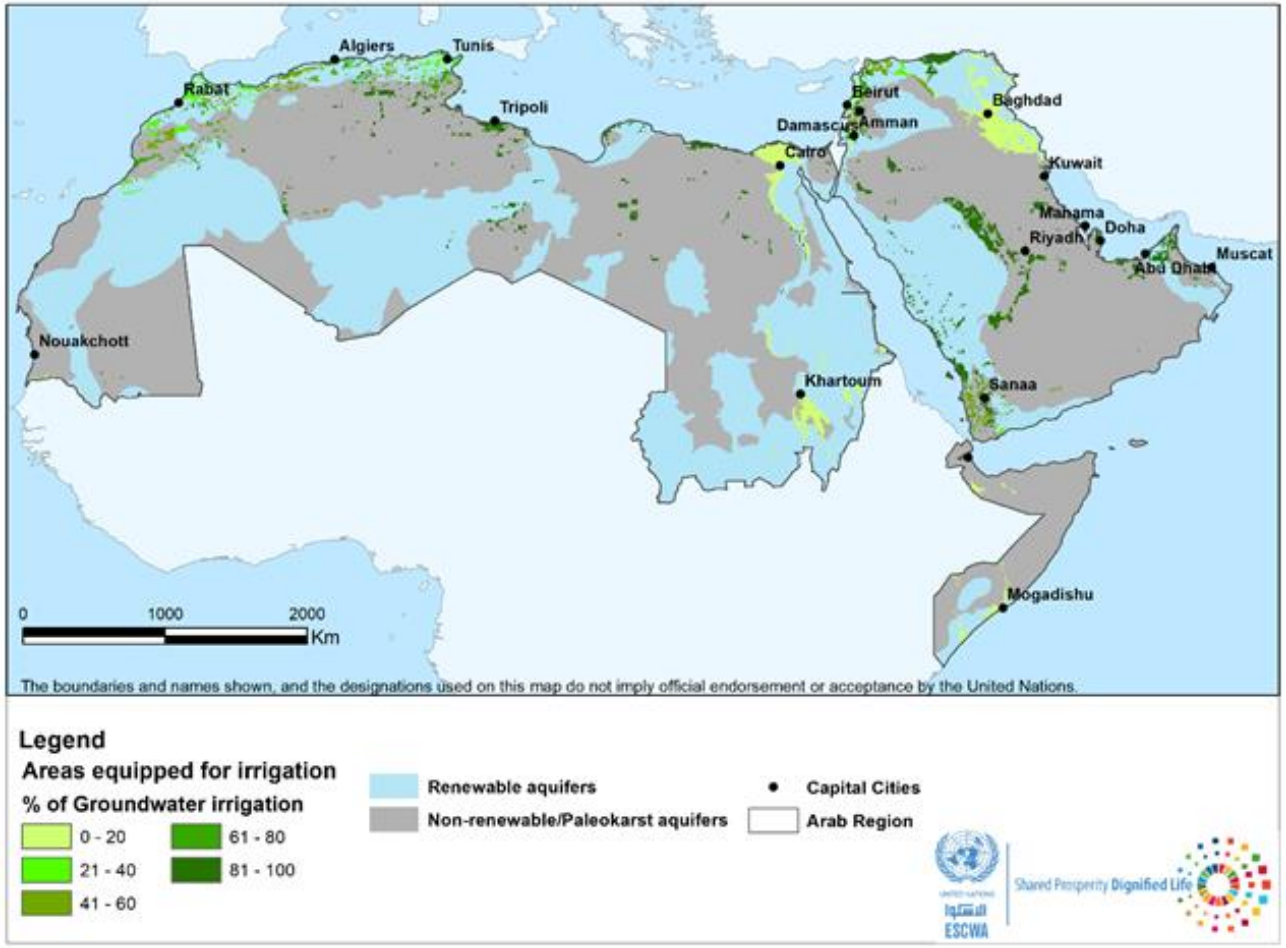
- More than half of the groundwater resources are non-renewable.
- The use of these shared non-renewable aquifers is not well planned, unregulated and unmonitored.

Need for integrated management and planning to avoid overexploitation that leads to depletion.

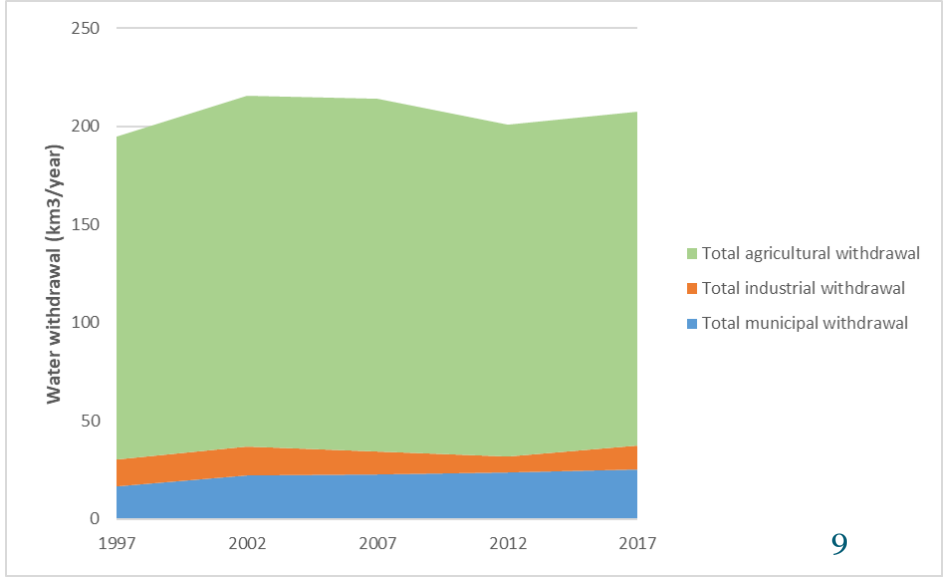


Groundwater Use: Groundwater and Food security

- Agriculture is the biggest consumer of groundwater.

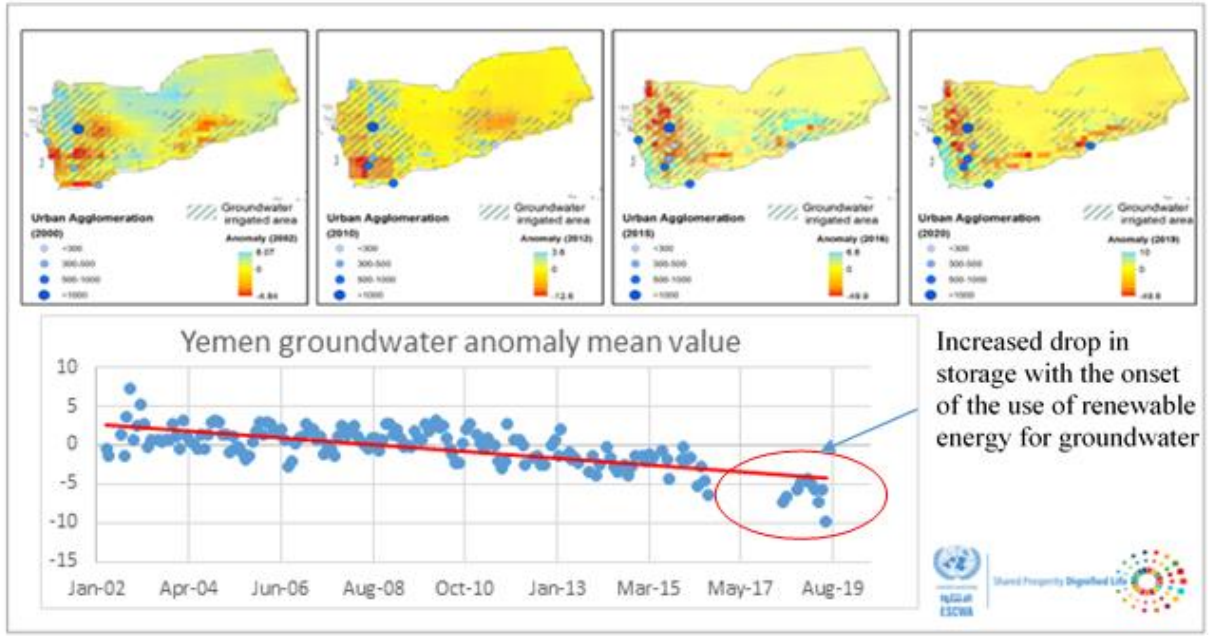


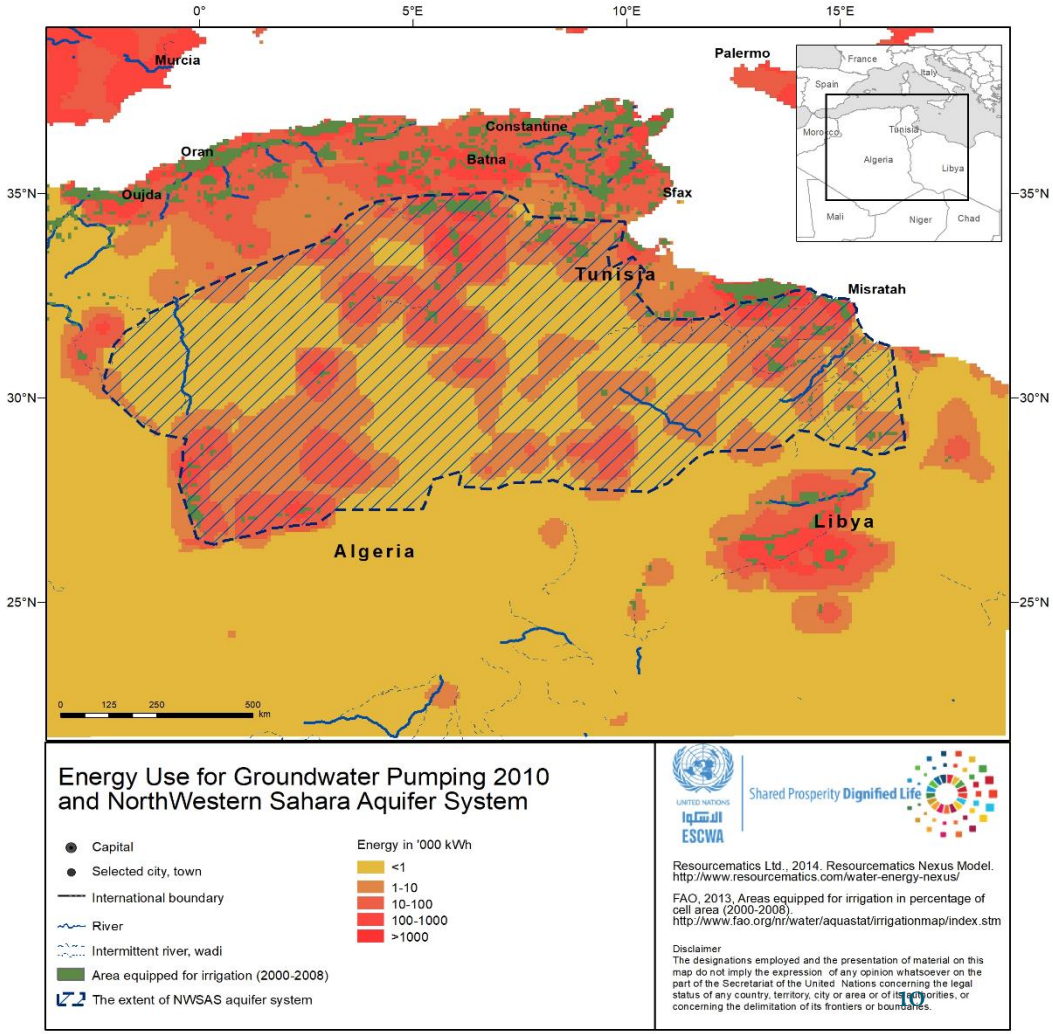
Water use efficiency in irrigation: 50-60% vs 80% in south-western United States and Australia.



Groundwater Use: Groundwater and Energy

- Groundwater exploitation is energy intensive
- Green energy solutions have added to the already existing groundwater stress.

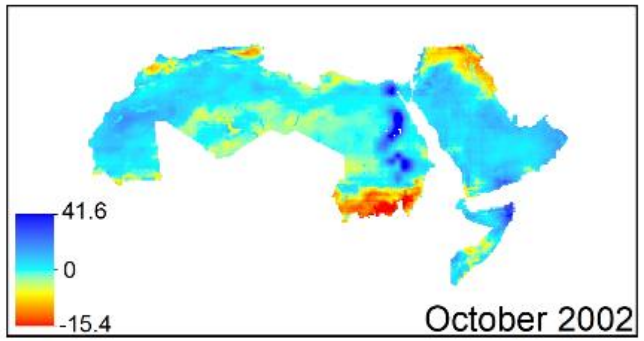




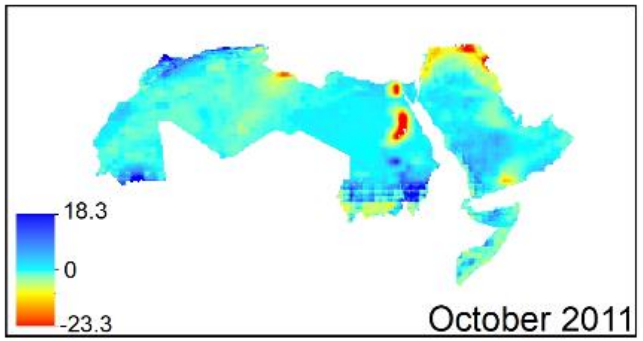
Groundwater Stress

- Groundwater over-exploitation

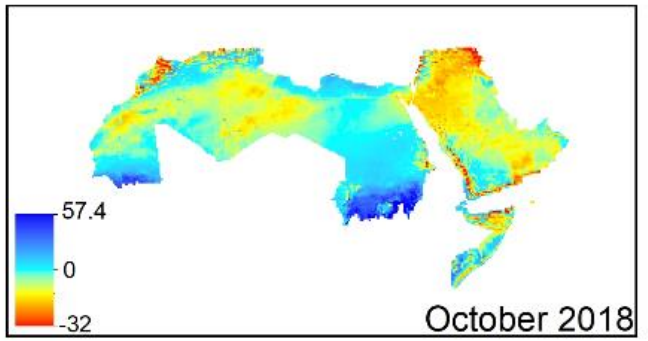
Base year



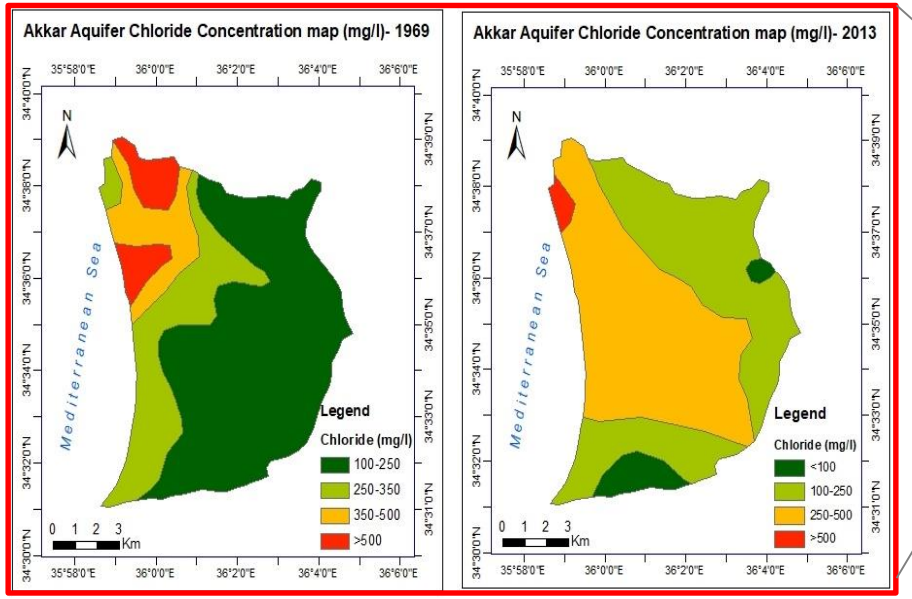
Area of groundwater storage decline increased by 75% compared to base year



Area of groundwater storage decline increased by 100% compared to base year



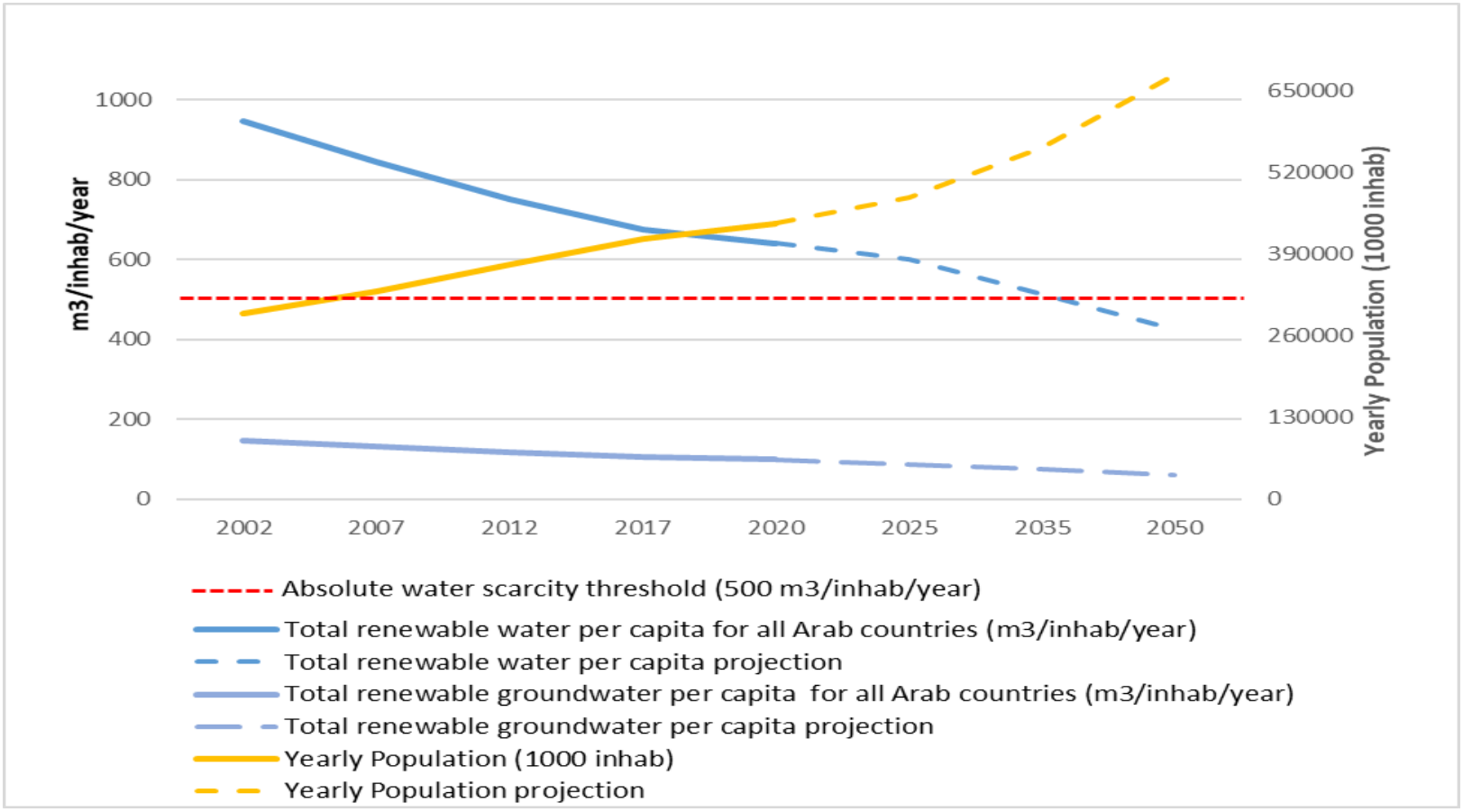
- Groundwater contamination and sea water intrusion in coastal areas

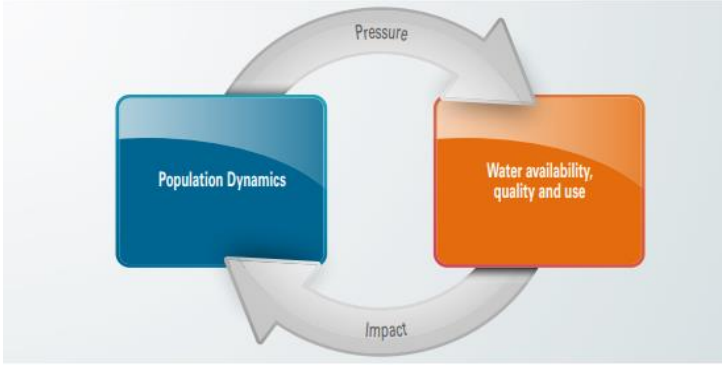


Sea water intrusion in Akkar, Lebanon

Population Growth:

- It is expected that by 2050, 17 States will be below the absolute water scarcity threshold.



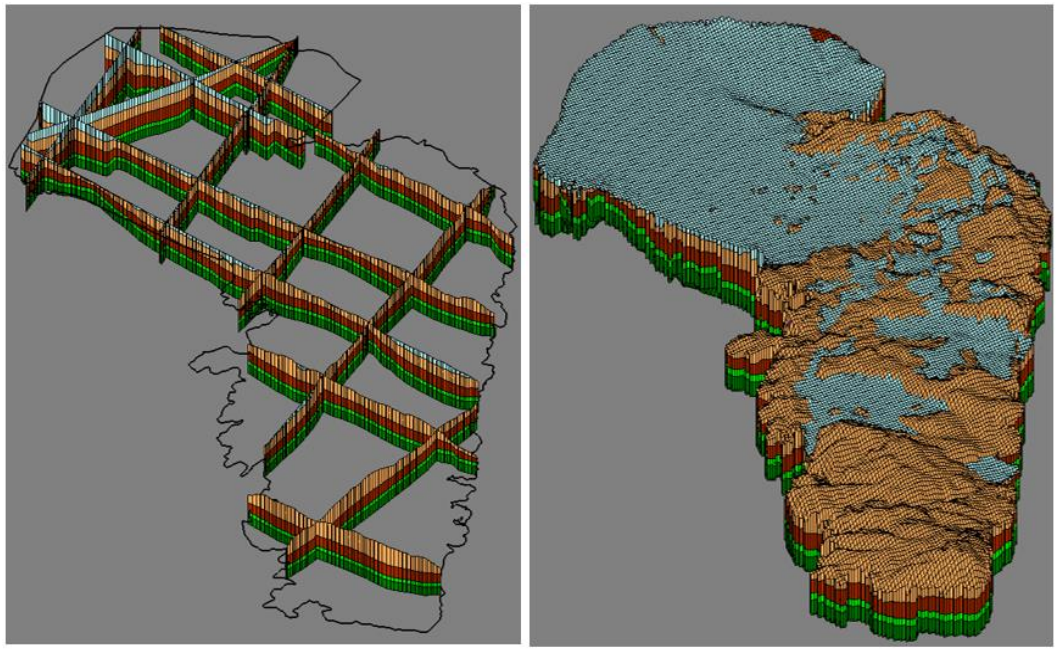


79% of the total population will be below the absolute water scarcity threshold

- Climate Change impact on groundwater,

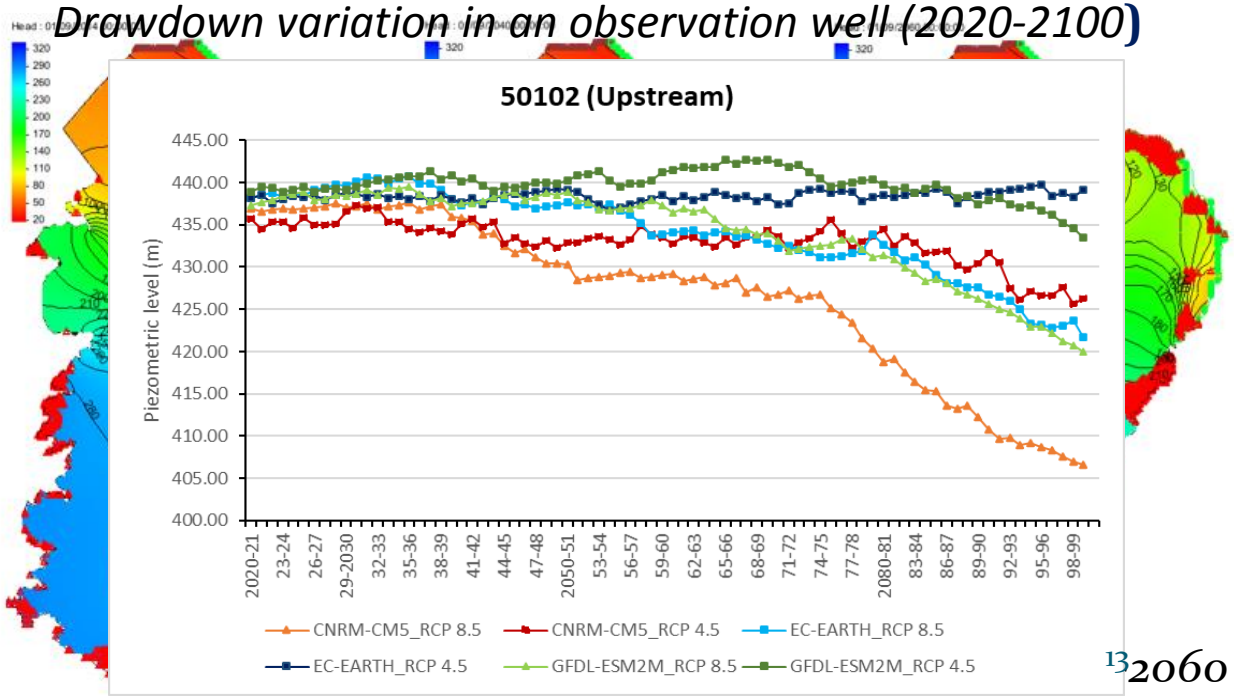
  ESCWA assessed the impacts of climate change on aquifers in Palestine and Morocco

- Groundwater rise in urban cities



Eocene aquifer, Palestine- Water Level distribution

Drawdown variation in an observation well (2020-2100)



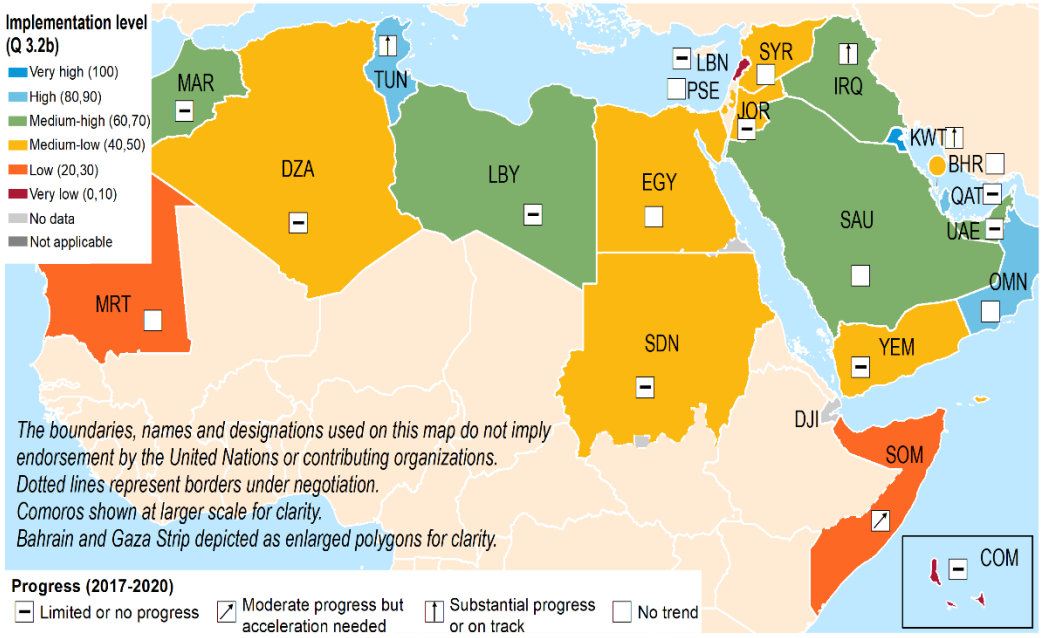
2060

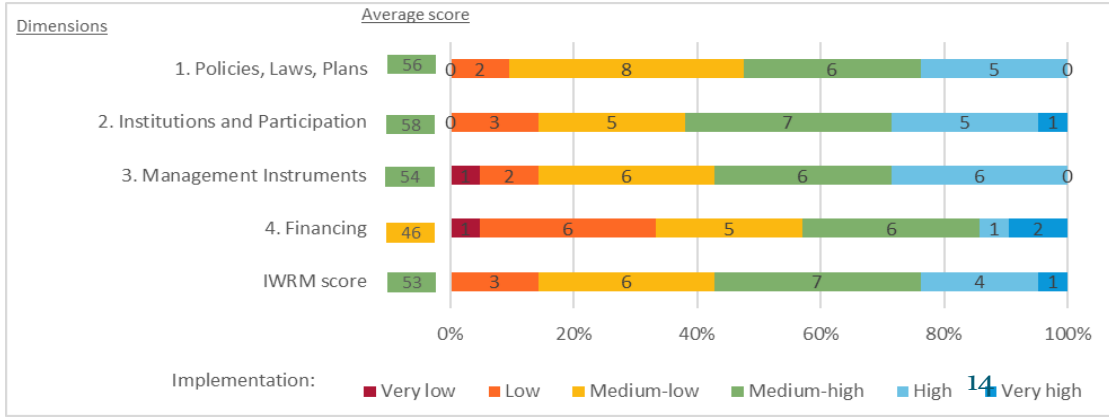
Groundwater Governance

Challenges in the Arab region:

- Inadequate groundwater specific policies and lack of political will for their implementation
- Weak groundwater institutions and limited funding
- Inadequate understanding of groundwater systems
- Limited community participation
- Lack of information coupled with weak monitoring systems and technology

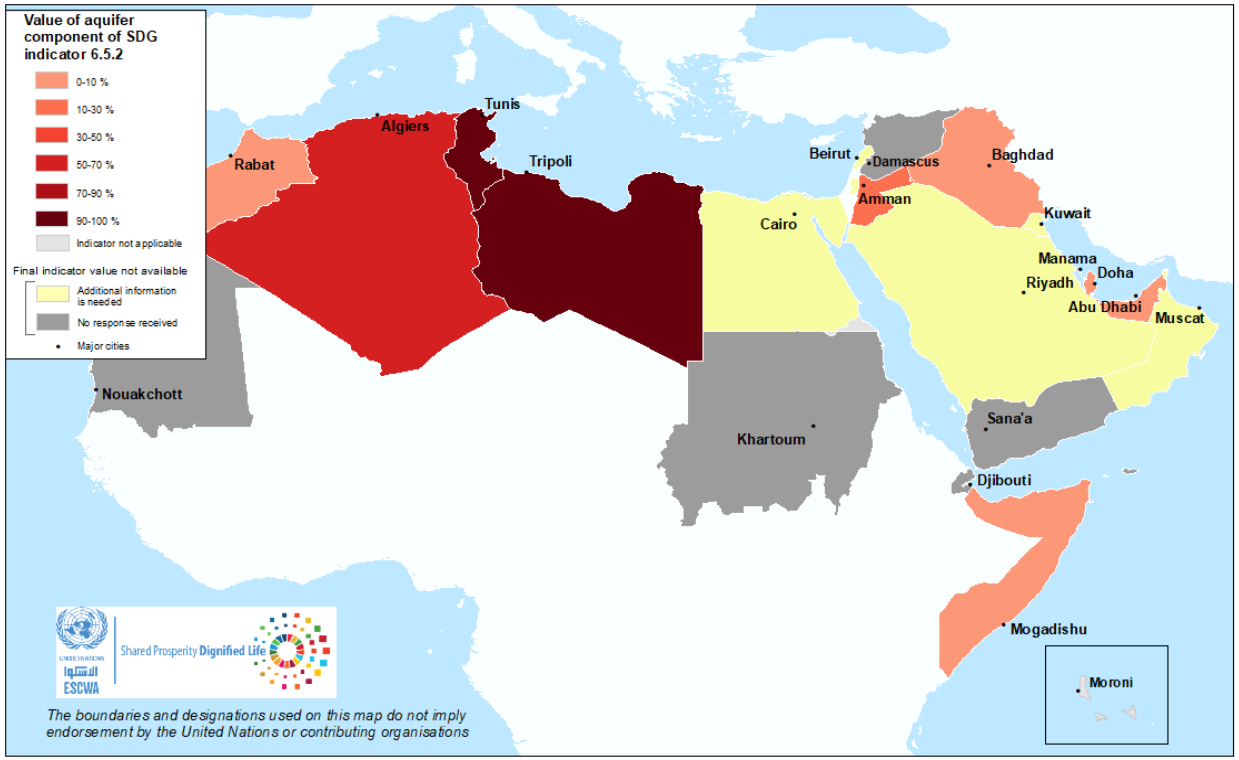
Country implementation of aquifer management instruments as per SDG indicator 6.5.1





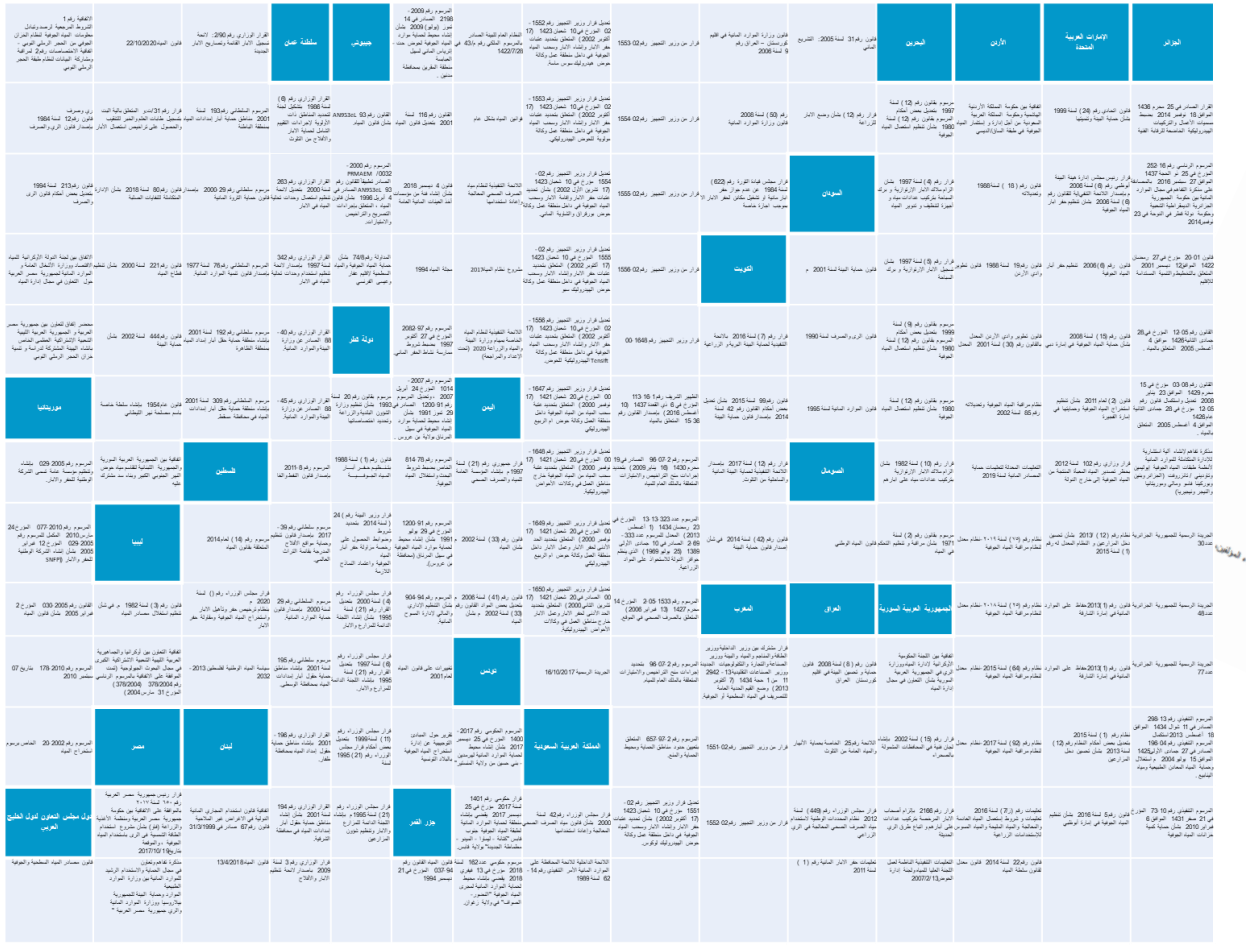
Transboundary Aquifers Management

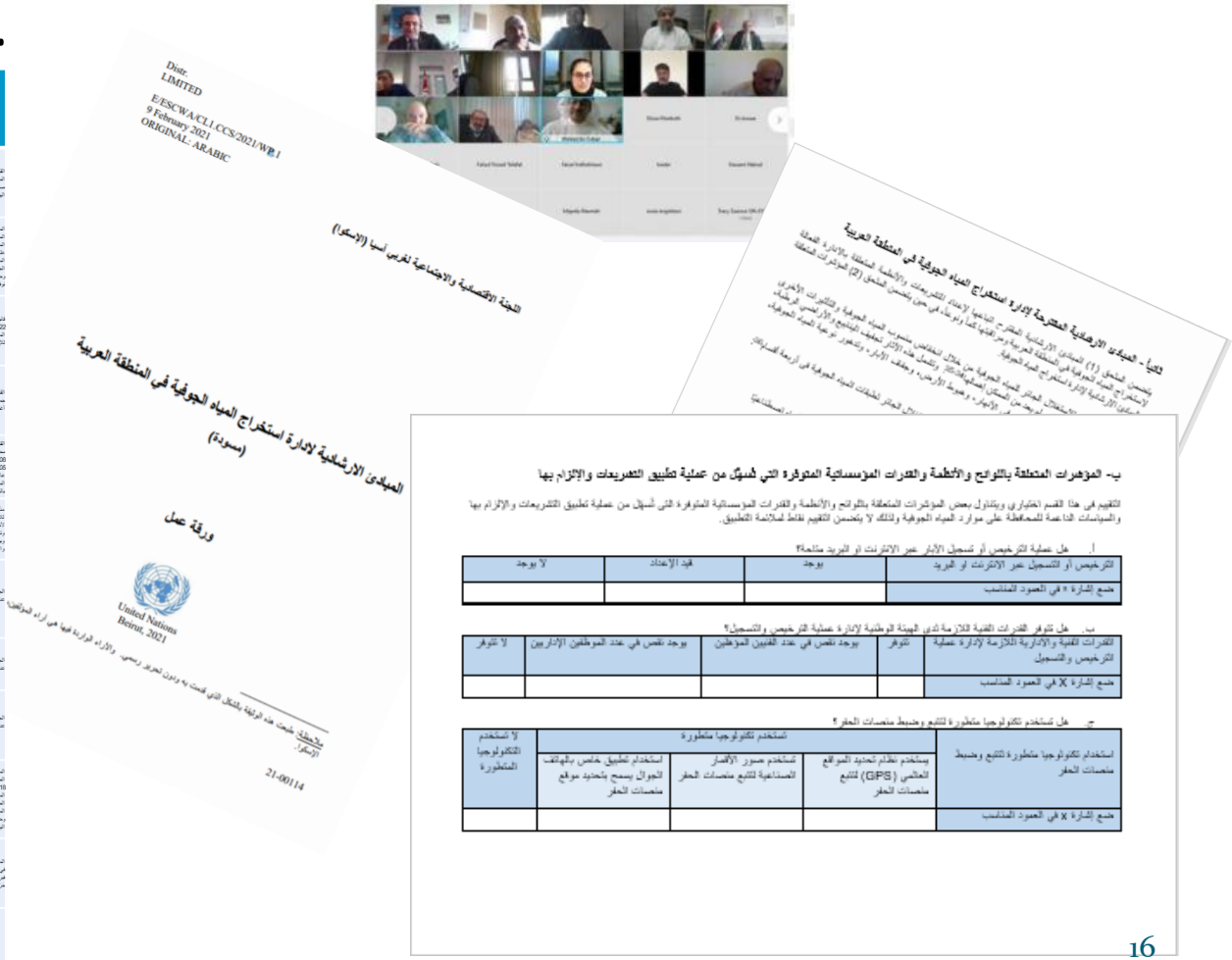
- All Arab States except for Comoros draw upon one or more transboundary groundwater resource.
- Cooperation arrangements in the region on groundwater have progressed *(NSAS, Saq-Ram, NWSAS, Senegalo-Mauritanian)*
- Data and understanding are still lacking on the regional scale



Improvements in data availability and understanding of transboundary groundwater systems are key to preserve this vital resource for future generations.

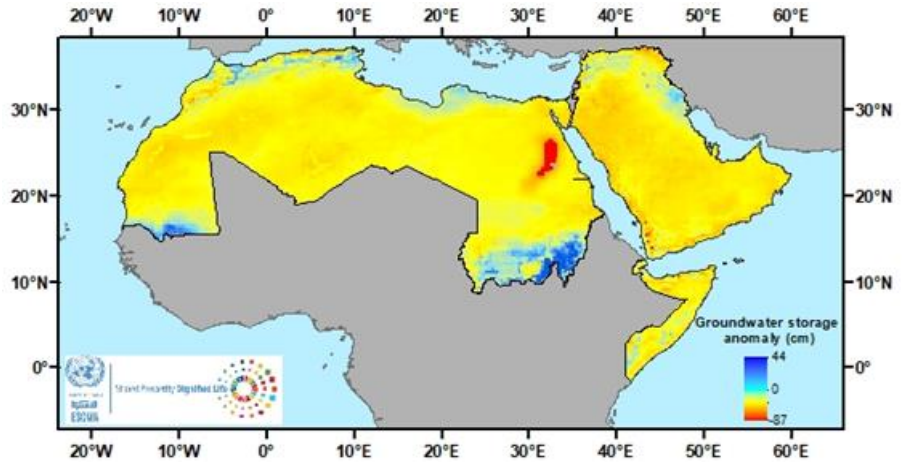
ESCWA issued Regional Groundwater Abstraction Management Guidelines that offers a unified approach to tackling overexploitation.



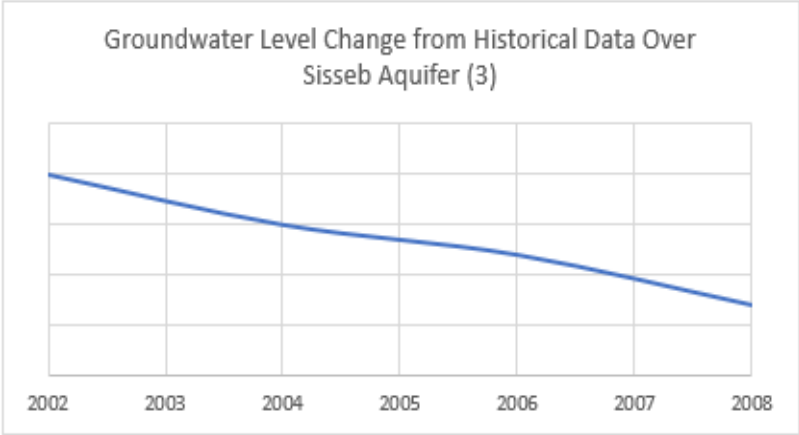


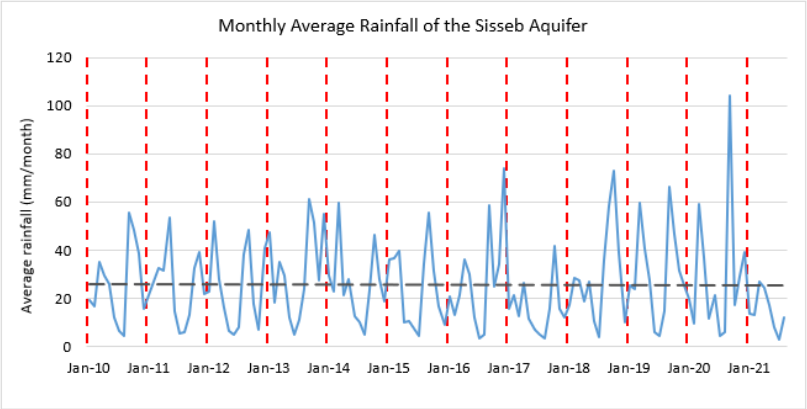
Disruptive technologies for Groundwater Management

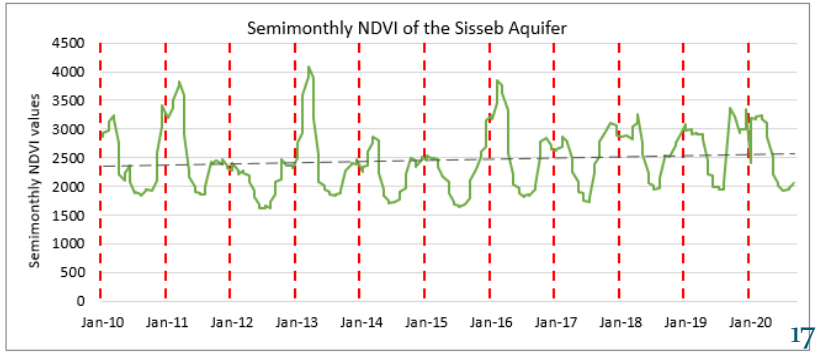
- Used for data collection, analysis, and dissemination
- GRACE RS data can be used to assess the change in groundwater storage
- Integrated RS and in-situ data has the highest accuracy



Change in groundwater storage anomaly between April 2002 and April 2019 in the Arab region



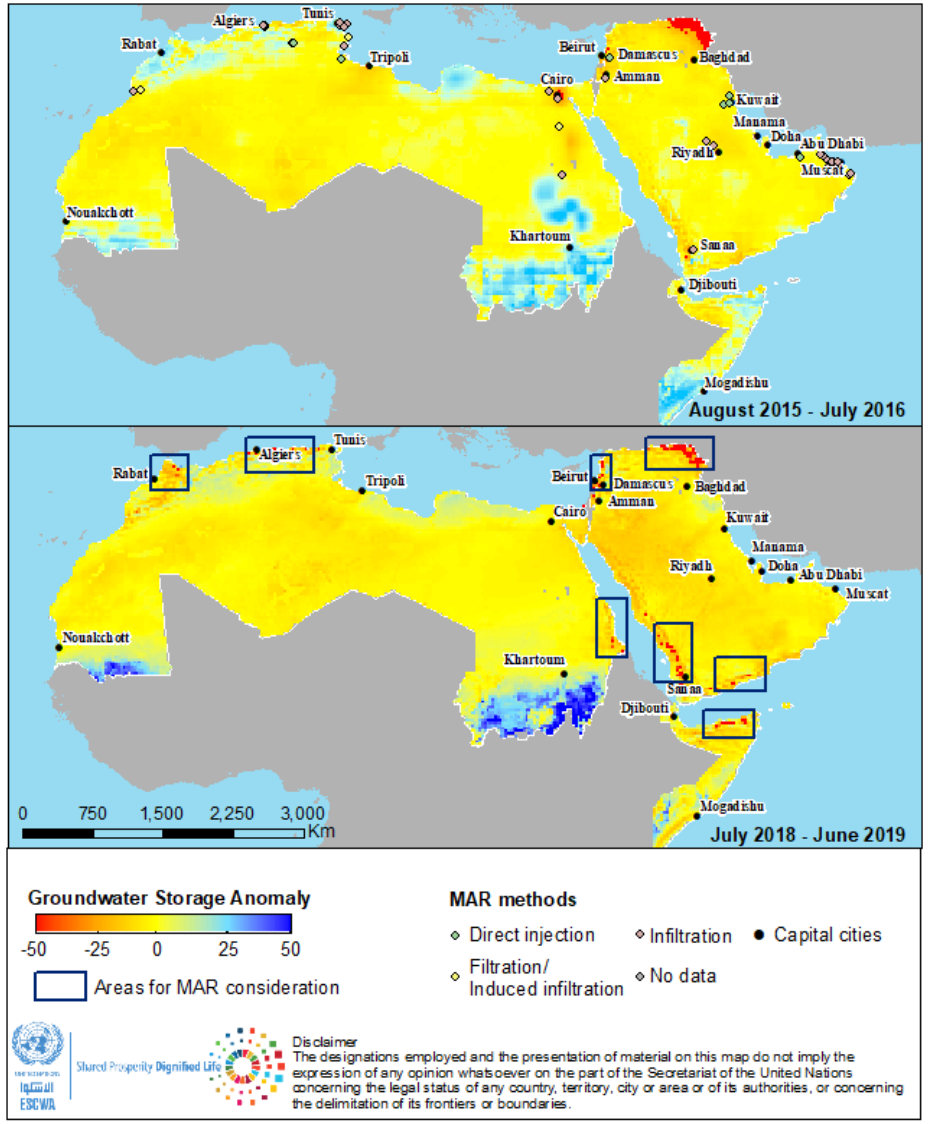




MAR to Improve Resilience

- Managed Aquifer Recharge (MAR) is a solution to increase/maintain groundwater level and/or improve groundwater quality.
- There are more than 44 MAR sites in the Arab region.
- Recharge dam is the most common type.
- 8 preliminary areas were selected where MAR can be a potential solution.

Liwa ASR project, Abu Dhabi



Arab Groundwater Digital Knowledge Platform

- A dedicated digital interactive platform, a user-friendly interface.
- Aims to increase and improve access to regional knowledge and information on groundwater.
- Empowers groundwater resources managers and regional stakeholders.
- Complements other regional knowledge platforms and networks that ESCWA has developed.

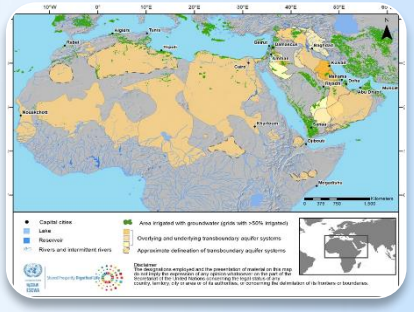
Key Messages

Groundwater and water scarcity

- Need for immediate actions.
- The use of integrated tools offers a great opportunity for adequate groundwater management.
- MAR is one the most promising approaches to alleviate water scarcity impacts and improve water security.

Groundwater and human activity

- Management of groundwater must extend into a coherent cross-sectoral governance approach.
- Groundwater depletion impacted activities affect vulnerable groups, women, and youth.
- Groundwater quality is affected by agricultural and industrial activities and by seawater intrusion.



Transboundary Groundwater

- Transfer of experience and knowledge.
- Leveraging innovative approaches and technologies.

Climate change and groundwater

- Insufficient action recognizing and acknowledging the role of groundwater in climate change resilience.
- Groundwater can be used as a reliable buffer.

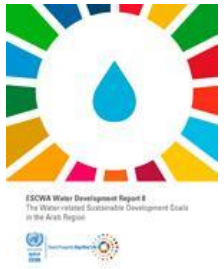
Groundwater governance

- Good information based on sufficient and reliable data with the needed investment to produce useful knowledge.
- ESCWA proposed regional groundwater abstraction management guidelines offer a unified approach to tackling overexploitation.

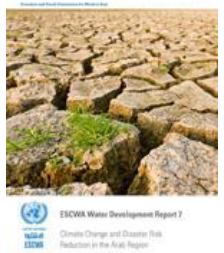
The importance of groundwater for the Arab region's water security under a changing climate demands improved governance through innovative management approaches, enhanced use of technologies and dedicated funding for better understanding of the resource and heightened regional cooperation.

Final Note

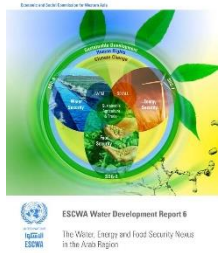
- More information can be found in the ESCWA Water Development Report 9 which is a recurrent publication issued once a biennium. Previous volumes have focused on:



- ESCWA Water Development Report 8: The Water-related Sustainable Development Goals in the Arab Region



- ESCWA Water Development Report 7: Climate Change and Disaster Risk Reduction in the Arab Region



- ESCWA Water Development Report 6: The Water, Energy and Food Security Nexus in the Arab Region

Credits and Acknowledgements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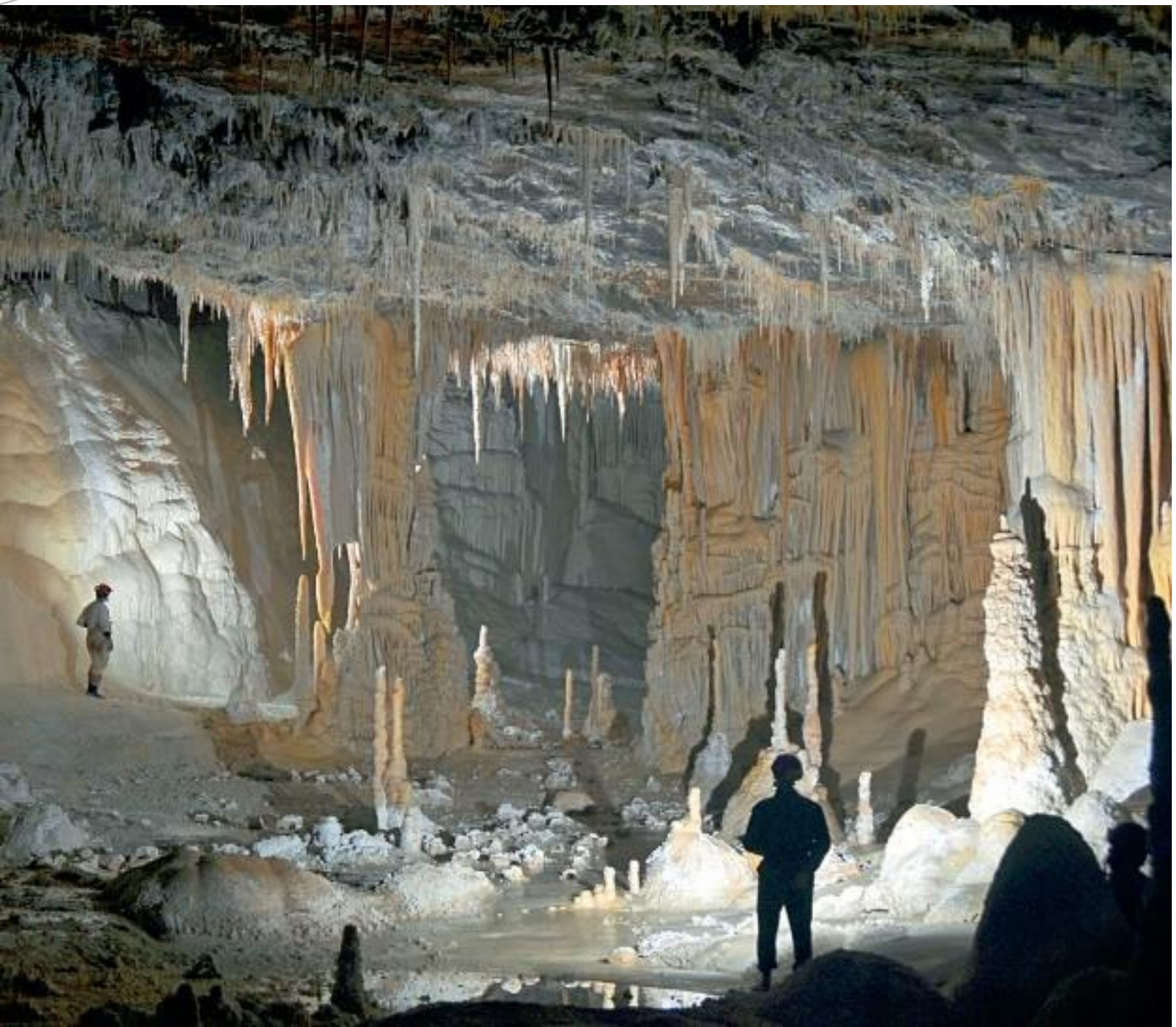

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