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
Importance of Groundwater

The World Water Day theme this year was “Groundwater: Making the invisible visible”

The groundwater year will end with a groundwater summit (6-8 December in Paris)

ESCWA coordinating regional discussions session for 5 regional commissions

Foster regional consultations on groundwater.

Identify Arab regional groundwater priorities for a deeper discussion through webinars leading to Groundwater Summit

Identify Groundwater Champion to represent region at the regional consultations session
Introduction: Global Water Resources

Groundwater represents an important component of the world's total fresh water.
• **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:
  - Low cost
  - High quality, in general
  - Safe in terms of its exposure to drought, especially with the repercussions of climate change
  - As for agricultural use, the value of groundwater is expected to be high

• The future use of groundwater will also be of vital importance to achieving the “Sustainable Development Goals” of the 2030 Development Agenda
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.
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.
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, Saqqara-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.**
• 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.

Acclerating decline in storage with the onset of the use of renewable energy for groundwater pumping.
Groundwater Stress

- Groundwater over-exploitation

- Groundwater contamination and sea water intrusion in coastal areas

Sea water intrusion in Akkar, Lebanon
Cont., Groundwater Stress

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.
Cont., Groundwater Stress

- 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)
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
Cont., Groundwater Governance

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

• Managed Aquifer Recharge (MAR) is a solution to increase/maintain groundwater level and/or improve groundwater quality.
• There are 10s of 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
Cont., Disruptive Technologies for Groundwater Management

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.
Cont., Key Messages

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.
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
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