



جامعة الخليج العربي
Arabian Gulf University



Groundwater Governance in the Arab Region

A diagnosis and the Way Forward

Waleed K Al-Zubari
Water Resources Management Program
College of Graduate Studies

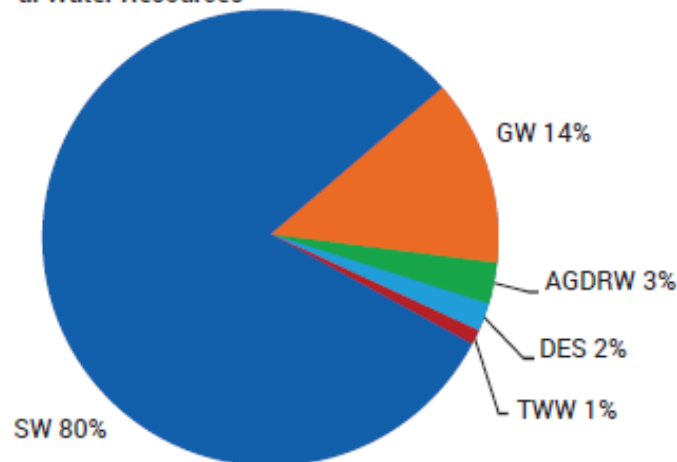
**UNESCO Cairo Office Special session on
Groundwater Governance in the Arab Region, 30 March, 2017**

Water Resources and Water Uses

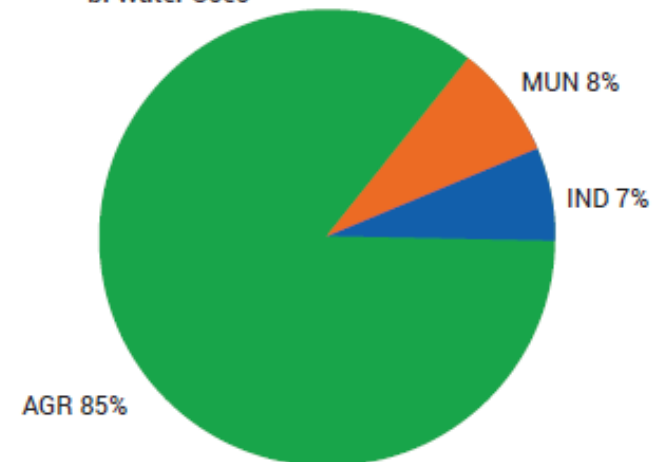
- GW is the second major water resource in Arab region
- GW dependency for some countries more than 80%
- GW use is steadily increasing in relatively surface water-rich countries due to increasing demands and reduction in SW
- Majority of GW are being used in Agricultural sector, followed by Municipal and then Industrial Sectors

Water Resources and Uses in the Arab Region (UNDP, 2013)

a. Water Resources



b. Water Uses

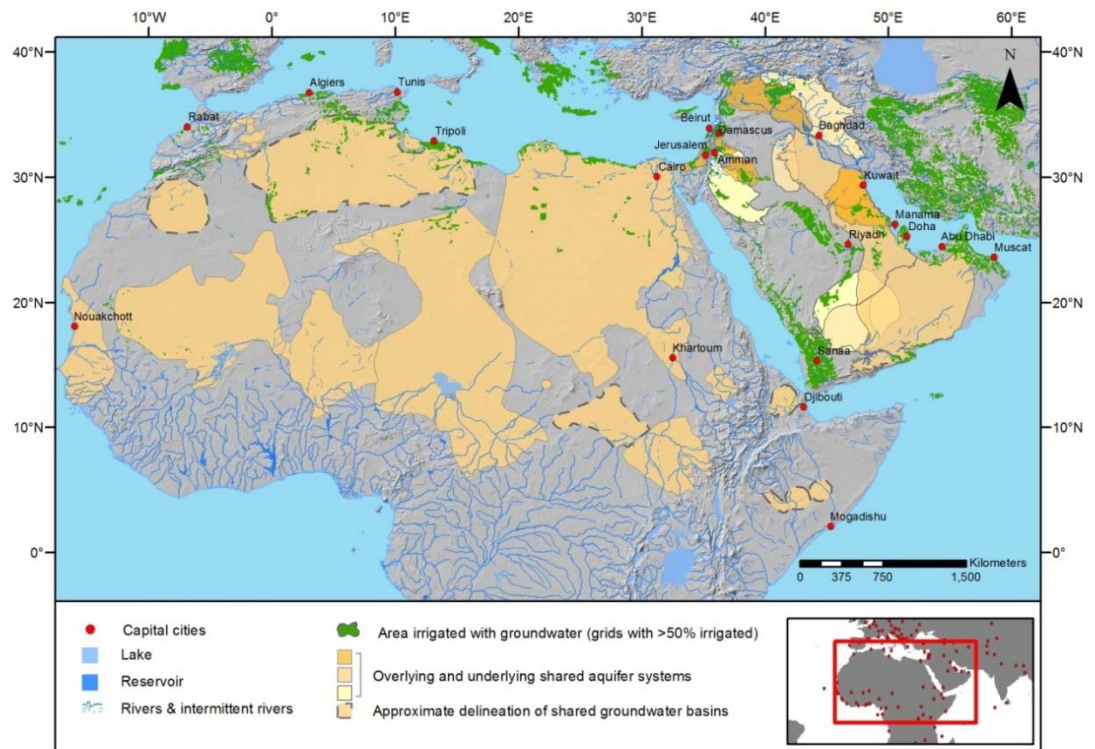


(SW: surface water, GW: groundwater, AGDRW: agricultural drainage water, DES: desalinated water, and TWW: treated wastewater; AGR: agricultural sector, MUN: municipal sector, IND: industrial sector)

Groundwater Resources

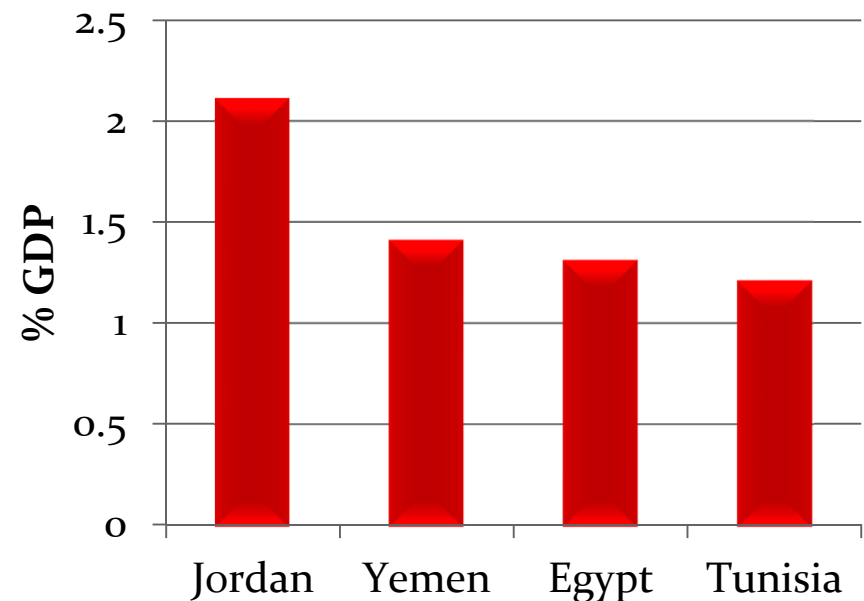
- Renewable shallow GW are in general limited, estimated renewability rate to be about 45 billion
- Non-renewable GW sources (fossil) are available in relatively wide areas in the Arab region and at relatively larger depths and are shared

**shared groundwater basins
and groundwater irrigated
areas in the Arab region.
Redrawn from UN-ESCWA
and BGR (2013)**



- both renewable and non-renewable GW are heavily utilized in most of Arab countries
- Non-renewable GW, with very limited exceptions, are being used in an unplanned manner and with uncertain trajectory
- GW are being threatened by numerous point and non-point sources of pollution generated from anthropogenic, agricultural, industrial, and domestic, activities
- Future GW availability to serve socio-economic development needs is threatened

Value of groundwater depletion in selected Arab countries (Ruta, 2005)





Groundwater Governance

- Governance is often mixed with management and remains fuzzy in the region
- WWAP Principles of Good Governance (Rogers and Hall, 2003; IRG, 2009)
 - Stakeholders participation; Transparency of Information, processes, and decisions; Equity in opportunity to improve wellbeing; Accountability; Coherency; Responsiveness; Integrative; and Ethics-based
- A working definition to GW Governance (Varady *et al.*, 2012)
 - Process by which GW is managed through the application of responsibility, participation, information availability, transparency, custom, and rule of law. It is the art of coordinating administrative actions and decision making between and among different jurisdictional levels—one of which may be global



Main Challenges to GW Governance

- Inadequate/Lack of clear groundwater policies and legislations
- Lack/inadequate political will for the implementation of groundwater policies and legislation
- Overall limited funding impacting management, monitoring and capacity development
- Weak groundwater institutions, fragmented or overlapping responsibilities, and weak coordination between involved sectors
- Inadequate understanding of groundwater systems and inadequate awareness
- Limited community participation
- Inadequate human resources capacity (and motivation due to low government salaries)
- Weak monitoring systems and Lack of information and/or data and/or needed technology



Groundwater Governance Priorities

- **Technical Level priorities**

- **Improving groundwater monitoring and surveying;** Developing reliable data systems and models for quality and quantity; Limiting abstraction to sustainable levels (controlling over-abstraction); Protecting groundwater quality from contamination (establishing groundwater protection zones); Promoting water conservation especially in agriculture); Training and capacity building of staff

- **Legal Level priorities**

- Enforcing groundwater legislations; Formulating clear policies; strategies and plans; Regulating abstraction; Controlling licensing for drilling and pumping and transparent licensing; transfer of licensing mandates; Water allocation plans

- **Infrastructure Level priorities**

- Implementing water supply projects to provide (potable) water to the population; Groundwater recharge techniques or dams

- **Awareness Level priorities**

- Promoting water conservation and increasing public awareness and increasing public engagement and stakeholder involvement



Needed Messages to Decision Makers in the Arab Region

GW are vital for the Arab countries and represents the only natural water sources in many countries

GW is a scarce and vulnerable strategic resource that must be monitored, well managed and planned, conserved, and protected to ensure its sustainability

GW are being overexploited and are dealt with as an undervalued commodity

Efficient management of GW must be a priority concern to decision makers; “Political will” is needed

GW management reforms are urgently needed before the destruction of these resources

Appropriate legislations and polices are required to protect GW and control exploitation

Strengthening the capacity of professionals working in the water sector is needed

Effective cooperation is needed at all levels and between different stakeholders, especially between GW competing sectors to preserve this vital resource for future generations