Inventory of Shared Water Resources in Western Asia
Overview, Key Findings and Outlook

10th Session of the Committee on Water Resources
21 March 2013, ESCWA, Beirut

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ESCWA-BGR Cooperation
Introduction I

The Inventory is...
the first UN-led effort to take stock of the region’s shared surface and groundwater resources in a comprehensive, systematic and standardized manner.

Key Themes:
• hydrology, hydrogeology
• water resources development and use,
• agreements and cross-border management efforts.

Objectives:
• Identify, and document the state of, shared water resources and their use
• Improve the knowledge base and facilitate information access
• Create awareness and stimulate informed dialogue within and between riparian countries
• Support regional processes towards improved dialogue and cooperation over shared water resources

Euphrates River – Syrian Arab Republic
Introduction II

Geographical Scope: covers all identified surface and groundwater resources shared between Arab Countries of Western Asia. Also covers water resources shared with Iran, Israel and Turkey.

- Arabian Peninsula
- Mashrek
- Mesopotamia
WORK IN PROGRESS: Mapping the research and production process

**COMPILATION OF INFORMATION**

**CONSOLIDATION**

**REVIEW & CONSULTATION**

**PUBLICATION**

**SOURCES**
- ESCWA reports
- Regional literature
- Scientific publications
- Country papers
- Media
- National statistics
- Maps
- Satellite data

**CORE INFORMATION/BASIN CHAPTER**
- Table of basin/aquifer facts
- Executive summary
- Overview map
- Basin description
- Introduction
- Hydro(geo)logy
- Water use
- Agreements, cooperation & outlook

**REVIEW PROCESS**
- Internal
- Technical experts
- Member countries: Focal points

**THE INVENTORY**
- Introduction
- Main findings
- Methodology
- Basin chapters
- References

Identification of Shared Basins in Western Asia
## Timeline and Consultation

<table>
<thead>
<tr>
<th>Year</th>
<th>Event</th>
<th>Details</th>
</tr>
</thead>
<tbody>
<tr>
<td>2008 Dec</td>
<td>Committee on Water Resources, 8th Session</td>
<td>Build national capacities on IWRM and shared waters; update assessment of legal and institutional tools for shared water management.</td>
</tr>
<tr>
<td>2009 Jun</td>
<td>Start of Work</td>
<td>Literature research, pre-screening, compilation of core information, hydrogeological interpretation.</td>
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<tr>
<td>2011 Mar</td>
<td>Committee on Water Resources, 9th Session</td>
<td>Recommendation to nominate focal points to support the finalization of the Inventory, and consider its outcomes.</td>
</tr>
<tr>
<td>2011 Apr-Sep</td>
<td>Nomination of focal points</td>
<td>Bahrain, Egypt, Iraq, Jordan, <em>Kuwait</em>, Lebanon, Oman, Palestine, Qatar, Saudi Arabia, Sudan, Syria, UAE, Yemen.</td>
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<tr>
<td>2011 May</td>
<td>Expert Consultation</td>
<td>Review of concept, hydrogeological interpretation and identified shared aquifer systems by regional and international experts.</td>
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<tr>
<td>2011 Oct-Nov</td>
<td>Circulation of Basin fact sheets and questionnaires</td>
<td>Information package for each shared basin/aquifer system with overview maps, tables, available data and literature list; request to review and complement core information.</td>
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</table>
### Timeline and Consultation II

<table>
<thead>
<tr>
<th>Year</th>
<th>Event Description</th>
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</table>
| 2011 Nov-Dec | Regional Consultative Meeting  
Discussion of findings and further steps, including submission of requested data.  
Participation: Egypt, Iraq, Lebanon, Oman, Saudi Arabia, Sudan, Syria, Yemen. |
| 2011 Dec | Follow-up and informal consultations  
Follow-up on data submission and clarification of content; via email, missions and back-to-back meetings, i.e. with Jordan, Lebanon, Palestine, Saudi Arabia, Syria. |
| 2012 May-Dec | Chapter review  
Circulation of completed draft basin chapters to focal points of riparian countries. In parallel, review of chapters by selected experts. |
| 2013 Feb-Mar | Final review  
Circulation of complete Inventory in layout for final review and comments. |
| 2013 Mar | Committee on Water Resources, 10th session  
Final report on preparation of Inventory and discussion of findings. |
| 2013 Apr | Publication  
Print and web publication of final Inventory. |
Overview: Shared River Basins

• Jordan River
• Orontes River
• Euphrates-Tigris-Shatt Al Arab
• El Kabir River
• Qweik River
## Overview: Shared River Basins in the Inventory

<table>
<thead>
<tr>
<th>SHARED RIVER</th>
<th>COUNTRIES</th>
<th>MAIN SHARED TRIBUTARIES</th>
</tr>
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<tbody>
<tr>
<td><strong>MESOPOTAMIA</strong></td>
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<tr>
<td>Euphrates River</td>
<td>Iraq, Jordan, Saudi Arabia, Syria, Turkey</td>
<td>Sajur River, Jallab/Balikh River, Khabour River</td>
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<tr>
<td>Tigris River</td>
<td>Iran, Iraq, Syria, Turkey</td>
<td>Feesh Khabour River, Greater Zab River, Lesser Zab River, Diyala River</td>
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<td>Shatt al Arab</td>
<td>Iran, Iraq</td>
<td>Karun River, Karkheh River</td>
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<td><strong>MASHREK</strong></td>
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<tr>
<td>Jordan River</td>
<td>Israel, Jordan, Lebanon, Palestine, Syria</td>
<td>Hasbani River, Banias River, Yarmouk River</td>
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<tr>
<td>Orontes River</td>
<td>Lebanon, Syria, Turkey</td>
<td>Afrin River, Karasu River</td>
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<td>Nahr el Kabir</td>
<td>Lebanon, Syria</td>
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<tr>
<td>Qweik River</td>
<td>Syria, Turkey</td>
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</tbody>
</table>
Overview: Shared Aquifer Systems
Mesozoic and Paleozoic Era
Overview:
Shared Aquifer Systems
Cenozoic Era
## Overview: Shared aquifer systems in the Inventory

<table>
<thead>
<tr>
<th>Shared Aquifer Systems</th>
<th>BH</th>
<th>EG</th>
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<td>Wasia Biyadh Aruma (South): Tawila-Mahra / Cretaceous Sands</td>
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<td>Basalt (SE): Azraq Basin</td>
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<td><strong>MESOPOTAMIA</strong></td>
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<td>Jezira Tertiary Limestone</td>
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<td>Neogene (NW) - Upper and Lower Fars: Jezira Basin</td>
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</table>

INVENTORY OF SHARED WATER RESOURCES IN WESTERN ASIA
### Overview: Shared Aquifer Systems without basin chapter

<table>
<thead>
<tr>
<th>NAME</th>
<th>LITHOLOGY</th>
<th>COUNTRIES</th>
</tr>
</thead>
<tbody>
<tr>
<td>Eastern Aquifer Basin</td>
<td>Limestone</td>
<td>Israel, Palestine</td>
</tr>
<tr>
<td>Ga’ara Aquifer System</td>
<td>Sandstones/carbonates</td>
<td>Iraq, Jordan, Saudi Arabia, Syria</td>
</tr>
<tr>
<td>Hammad Basin</td>
<td>Basalt, carbonates and marl</td>
<td>Jordan, Syria</td>
</tr>
<tr>
<td>North-Eastern Aquifer Basin</td>
<td>Predominantly limestone</td>
<td>Israel, Palestine</td>
</tr>
<tr>
<td>Wasia-Biyadh-Aruma Aquifer System (Centre): Gulf</td>
<td>Sandstones/carbonates</td>
<td>Bahrain, Qatar, Saudi Arabia, United Arab Emirates</td>
</tr>
<tr>
<td>Western Galilee Basin</td>
<td>Limestone and dolomite</td>
<td>Israel, Lebanon</td>
</tr>
</tbody>
</table>

**Criteria:**
- Limited size / Scale of Inventory
- Limited shared portion
- Limited exploitability (i.e. depth, salinity, oil-bearing, facies change)
Inventory Features

- A total of 23 shared aquifer systems and 6 shared river basins were identified.
- 9 chapters on shared surface waters and 17 chapters on shared aquifer systems, each following a standardized structure and methodology.
- 624 pages of detailed information with 60 new maps and over 200 figures, tables and boxes.
### Chapter Features

#### GROUNDWATER CHAPTER

**INTRODUCTION**
- Location
- Area
- Climate
- Population
- Other aquifers in the area
- Information sources

**HYDROGEOLOGY**
- Aquifer configuration
- Stratigraphy
- Aquifer thickness
- Aquifer type
- Aquifer parameters
- Recharge
- Flow regime
- Storage
- Discharge
- Water quality
- Exploitability

#### SURFACE WATER CHAPTER

**GEOGRAPHY**
- River course
- Climate
- Population

**HYDROLOGICAL CHARACTERISTICS**
- Annual discharge variability
- Flow regime
- Groundwater linkages

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INVENTORY OF SHARED WATER RESOURCES IN WESTERN ASIA
Chapter Features II

**GROUNDWATER CHAPTER**

- **GROUNDWATER USE**
  - Abstraction and use
  - Quality issues
  - Sustainability issues

- **AGREEMENTS, COOPERATION & OUTLOOK**
  - List of agreements
  - Cooperation between riparian countries
  - Outlook

- **NOTES**

- **BIBLIOGRAPHY**

**SURFACE WATER CHAPTER**

- **WATER RESOURCES MANAGEMENT**
  - Development and use
  - Water quality & environmental issues

- **AGREEMENTS, COOPERATION & OUTLOOK**
  - List of agreements
  - Cooperation between riparian countries
  - Outlook

- **NOTES**

- **BIBLIOGRAPHY**

*INVENTORY OF SHARED WATER RESOURCES IN WESTERN ASIA*
10 Key Findings

1. There are more shared water resources in Western Asia than generally assumed.

2. Water quantity and allocation dominate the discourse on shared water resources in this water-scarce region.

3. Water quality is rapidly deteriorating, a fact that is largely neglected.

4. The lack of accurate data hampers joint water resources management.

5. Cooperation over shared water exists, but is never basin-wide.

6. There is not a single agreement on shared groundwater resources.

7. The region's groundwater is largely non-renewable and aquifers are rapidly being depleted.

8. Groundwater plays an important role in surface water basins, a link which is often overlooked.

9. A new thinking is required to deal with large regional aquifer systems from a shared perspective.

10. It is already too late to save some shared waters.
Conclusions

• Descriptive, scientific baseline for further dialogue on shared surface and groundwater resources is available.
• Inter-active consultative process with countries has enhanced the value of the product.
• The process itself has created awareness and stimulated dialogue.

Discussion

• How do you see the overall benefits of the ‘Inventory’ product?
• What can we learn from the ‘Inventory’ process?
• Where do you see opportunities in the use and application of this ‘Inventory’?
• How could we build on the Inventory? Updates? Expansion to other Arab States?
VISIT OUR WEBSITE
www.waterinventory.org

Thank you for your attention!

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