

## Chapter 10

# Saq-Ram Aquifer System (West)



INVENTORY OF  
**SHARED WATER RESOURCES**  
IN WESTERN ASIA (ONLINE VERSION)



**BGR** Bundesanstalt für  
Geowissenschaften  
und Rohstoffe



United Nations Economic and Social Commission for Western Asia

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## EXECUTIVE SUMMARY

The Saq-Ram Aquifer System (West) extends on the surface from northern Saudi Arabia into Jordan. At present, it is exploited from the Tabuk Plain in Saudi Arabia to Wadi Rum in Jordan, in an area delineated in this Inventory as the Tabuk-Mudawwara-Disi area.

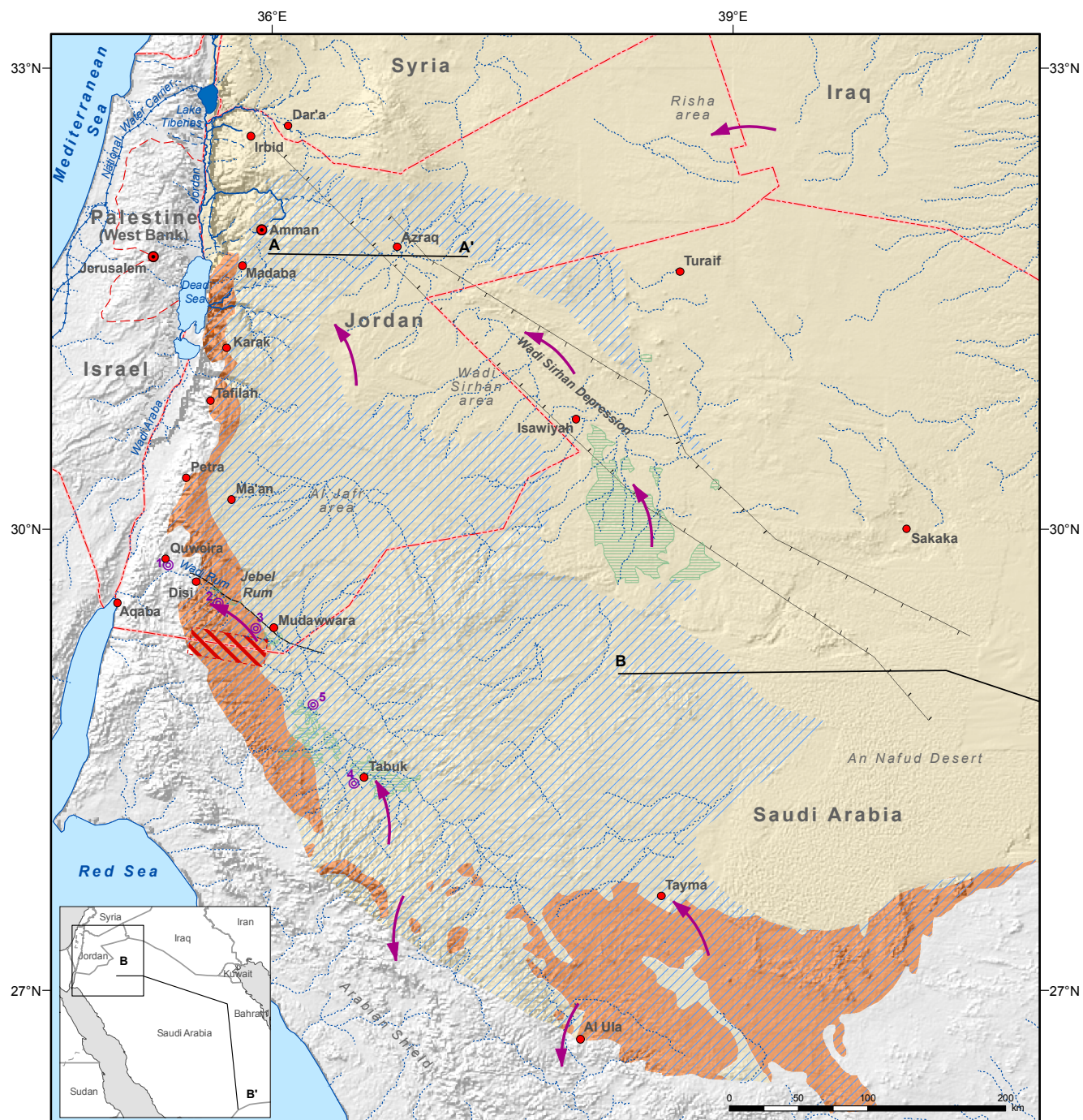
In Jordan, where the aquifer system is known as the Ram Group, it is widely exposed in the southern desert and is present in the subsurface throughout most of the country. Current abstraction in the Mudawwara-Disi area (Jordan) is 60 MCM/yr although higher values of 70-80 MCM/yr were reported in 2008.

In Saudi Arabia south of the Jordanian border (Tabuk area), the Saq lies directly on the Basement and dips gradually towards the north/north-east under less permeable formations. Groundwater abstraction in the Tabuk area has increased drastically from about 29 MCM/yr in 1983 to between 1,050-1,700 MCM/yr in 2004, mostly in the agricultural sector, while recharge remains at 3-10 MCM/yr. The heavy mining of the aquifer system has resulted in water level drops of up to 32 m/yr in the late 1980s in Saudi Arabia. There are indications that the exploitable part of the resource may be exhausted within 30-40 years, unless abstraction can be controlled on both sides of the border.

## BASIN FACTS

<b>RIPARIAN COUNTRIES</b>	Jordan, Saudi Arabia
<b>ALTERNATIVE NAMES</b>	Disi, Disi Mudawwara, Ram, Rum, Saq, Saq-Tabuk
<b>RENEWABILITY</b>	Low (2-20 mm/yr)
<b>HYDRAULIC LINKAGE WITH SURFACE WATER</b>	Weak
<b>ROCK TYPE</b>	Porous
<b>AQUIFER TYPE</b>	Unconfined in shallow layers; confined or leaky in deeper layers
<b>EXTENT</b>	308,000 km <sup>2</sup>
<b>AGE</b>	Paleozoic (Cambro-Ordovician)
<b>LITHOLOGY</b>	Sandstones
<b>THICKNESS</b>	250-700 m Eastern Jordan: ≥1,000 m Risha Area: 500 m
<b>AVERAGE ANNUAL ABSTRACTION</b>	Jordan: 90 MCM Saudi Arabia: >1,000 MCM
<b>STORAGE</b>	Jordan: 4-10 BCM Saudi Arabia: ~740 BCM
<b>WATER QUALITY</b>	Fresh (mostly <1,000 mg/L TDS)
<b>WATER USE</b>	Mainly agricultural. A rise in municipal and industrial use is expected.
<b>AGREEMENTS</b>	-
<b>SUSTAINABILITY</b>	Overexploitation due to agricultural development. Possible health risk due to high natural radioactivity (Ra).

## OVERVIEW MAP



## Saq-Ram Aquifer System (West)

- Capital
- Selected city, town
- International boundary
- - - Armistice Demarcation Line
- ~ River
- ~ Intermittent river, wadi
- Canal
- Freshwater lake
- Dike
- A—A' Approximate location of geological cross-section
- Graben
- Saq-Ram outcrop
- Approximate subsurface extent of the aquifer formations
- /// Approximate extent of exploitable area
- /// Zone of agricultural development (selection)
- /// No drilling zone
- Direction of groundwater flow
- ⊙ Water supply well fields
  - 1 Quweira
  - 2 Dubaydib
  - 3 Mudawwara
  - 4 Tabuk
  - 5 Uyanah



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## Inventory of Shared Water Resources in Western Asia

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