Chapter 17

Wadi Sirhan Basin

Tawil-Quaternary Aquifer System

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

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Tawil-Quaternary Aquifer System

Wadi Sirhan Basin

EXECUTIVE SUMMARY

The Wadi Sirhan Basin is situated in Jordan and Saudi Arabia and forms a central depression surrounded by basalt and sedimentary plateau areas in the north and south. The basin surface is covered by Paleogene and Quaternary deposits, which make up the upper part of the exploited aquifer system. In the subsurface, thick deposits of Cretaceous and Tawil-Sharawra Formations occur in the depression and along the boundaries of the aquifer system. They constitute the lower part of an aquifer system that is denoted as the Tawil-Quaternary Aquifer System in this Inventory.

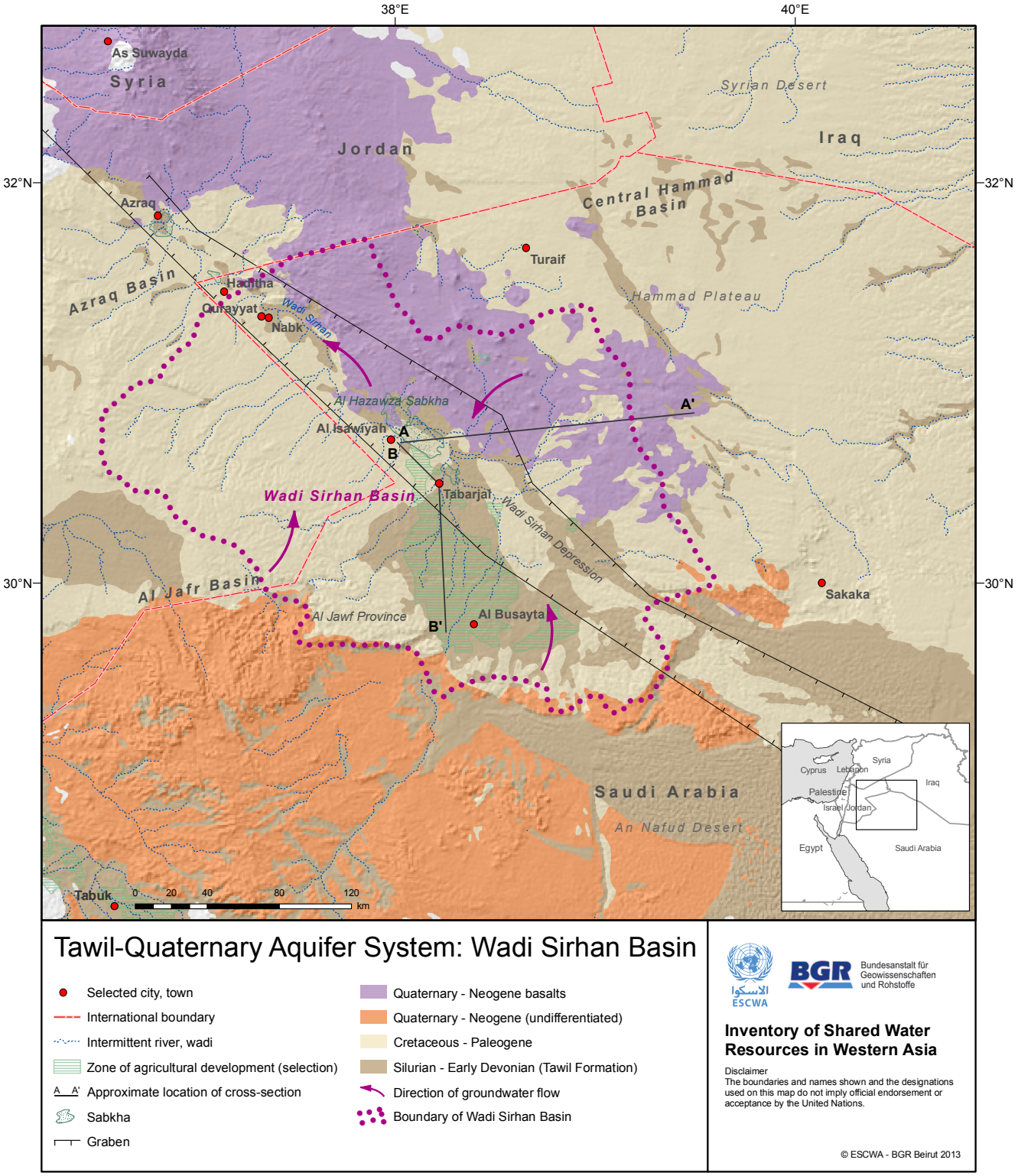
This aquifer appears to have evolved as part of the groundwater system in the Sakaka-Azraq areas, with limited recharge entering the system in the form of Mediterranean-type rainwater. Groundwater flows from the basalt and limestone plateau areas towards the central depression where it follows the hydraulic gradient in a south-east/north-west direction.

Since exploitation of the aquifer system started in 1986, annual abstraction for irrigation purposes has risen from about 100 MCM in 1984 to almost 3,500 MCM in 2004. However, the lower part of the aquifer system appears to have potential for further exploitation as only a few of the approximately 100 wells tapping this part of the aquifer system show signs of significant drawdown.

BASIN FACTS

RIPARIAN COUNTRIES	Jordan, Saudi Arabia
ALTERNATIVE NAMES	Azraq Graben, Secondary-Tertiary-Quaternary Aquifer Complex (STQ), Sharawra, Sirhan Basin, Sirhan-Hamza Graben
RENEWABILITY	Very low (0-2 mm/yr)
HYDRAULIC LINKAGE WITH SURFACE WATER	Weak
ROCK TYPE	Porous to fractured
AQUIFER TYPE	Mainly unconfined
EXTENT	~44,000 km^2
AGE	Upper part: Upper Cretaceous to Quaternary Lower part: Early Devonian-Silurian
LITHOLOGY	Basalt, alluvium, limestone and sandstones with some marl
THICKNESS	Upper part: <1,300 m Lower part: 200-300 m
AVERAGE ANNUAL ABSTRACTION	1984: 100 MCM 2004: 3,500 MCM
STORAGE	22 BCM
WATER QUALITY	Fresh to saline
WATER USE	Irrigation
AGREEMENTS	-
SUSTAINABILITY	Over-exploitation of the upper part of the aquifer system, especially in the south for irrigation

OVERVIEW MAP



Tawil-Quaternary Aquifer System: Wadi Sirhan Basin

- Selected city, town
- International boundary
- Intermittent river, wadi
- Zone of agricultural development (selection)
- A A' Approximate location of cross-section
- Sabkha
- Graben
- Quaternary - Neogene basalts
- Quaternary - Neogene (undifferentiated)
- Cretaceous - Paleogene
- Silurian - Early Devonian (Tawil Formation)
- Direction of groundwater flow
- Boundary of Wadi Sirhan Basin

ESCWA

BGR Bundesanstalt für Geowissenschaften und Rohstoffe

Inventory of Shared Water Resources in Western Asia

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