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Geology of Iraq

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Chapter 1: Introduction

1.1 Preface

Iraq lies between latitudes 29° and 38° N, and longitudes 39° and 49° E. It is the 58th-largest country in the world spanning 437,072 km² (168,754 sq mi). It is comparable in size to the US state of California (Figure 1).

Iraq, officially known as the Republic of Iraq is a country in Western Asia, bordered by Turkey to the north, Iran to the east, Kuwait to the southeast, Saudi Arabia to the south, Jordan to the southwest and Syria to the west. The capital, and largest city, is Baghdad.

Iraq has a coastline measuring 58 km (36 miles) on the northern Persian Gulf (Arabian Gulf) and encompasses the Mesopotamian Alluvia Plain, the northwestern end of the Zagros mountain range and the eastern part of the Syrian Desert. Two major rivers, the Tigris and Euphrates, run south through Iraq and into the Shatt Al-Arab near the Persian Gulf. These rivers provide Iraq with significant amounts of fertile land.

The region between the Tigris and Euphrates rivers, historically known as Mesopotamia, is often referred to as the “Cradle of Civilization”. It was here that mankind first began to read, write, create laws and live in cities under an organized government, notably Uruk, from which “Iraq” is derived. It is worth to mention that Uruk was an ancient city of Sumer (and later of Babylonia), situated east of the present bed of the Euphrates river, on the dried-up, ancient channel of the Euphrates, some 30 km east of modern Samawah, Al-Muthanna, Iraq.

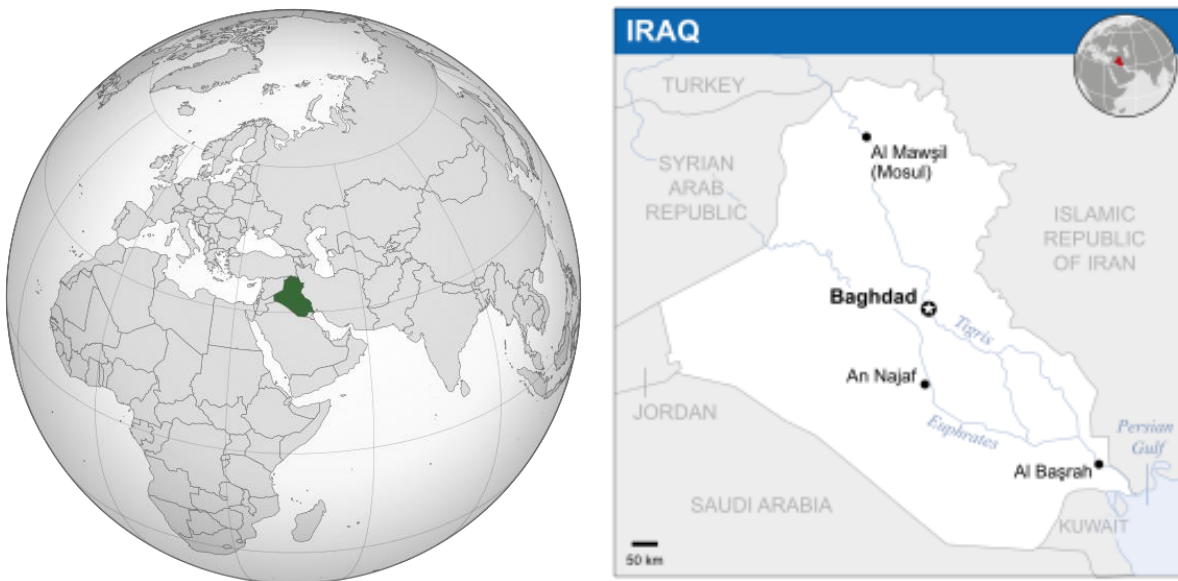


Figure 1.1: Location of Iraq on the world map (left panel) and comparing to the neighbor countries (right panel).

1.2 History of geological investigations in Iraq

- The Iraq Petroleum Company (IPC) (1921 - ????)

The first reconnaissance geological surveys in Iraq were carried out during the First World War and culminated in the discovery of oil in the 1920's. The contribution of the oil industry in the early stages of the development of the country after independence in 1921 played an important role in advancing the geological profession in Iraq. The Iraq Petroleum Company (IPC) and its sister companies conducted surface geological mapping in N Iraq, and subsurface mapping of S Iraq. IPC geologists published key stratigraphic information in 1959.

- The Site Investigation Company and Parsons Company (1954 – 1958) which worked under the Development Council (Majlis Al-I'mar) led to an ambitious program for metallic mineral, building material and ground water exploration in Iraq. The geology of N and NE Iraq was mapped during this period. Six sheets of 1:100,000 scale maps were completed for the important border region with Iran and Turkey.

- The Geology Department at Baghdad University (1954 – Recent) which was established which immensely influenced the geological profession in Iraq.

- Soviet State Companies (1961 - ????) which mapped NE Iraq for metallic deposits and W Iraq for phosphate, glass sand, and clay.

- The Iraqi National Oil Company (INOC) (1964 - ????) was established in 1964. After the nationalization of IPC in 1972, INOC conducted seismic surveys and exploration drilling. INOC became the sole body responsible for exploration, production, refining and marketing in Iraq. Oil bearing structures were delineated by seismic surveys and drilling, and many new oil fields were discovered.

- Geological Survey and Mining (GEOSURV) (1969 – Recent)

Geological surveys in Iraq remained restricted until the establishment of the "Directorate General of Geological Survey and Mineral Investigation" (GEOSURV) in 1969 (presently the State Company for Geological Survey and Mining). Its initial task was to systematically cover the whole country with regional surveys at a final scale of 1: 100,000 and to establish the potential mineral wealth of Iraq. A ten-year program (1972-1982) was conducted almost entirely by young Iraqi graduates from Iraqi universities and geological specialists. Some small areas were mapped through cooperation with the Czech Geological Survey whose experts also helped to establish many laboratories and advised on the survey policies. The completion of the regional geological surveys was followed by the compilation of maps. The next stage of the surveys included detailed geological mapping of high graded areas for mineral exploration or land use.

Detailed mapping for sulphur, phosphate, industrial clays, bauxite, glass sand, limestone and salt was conducted first. Areas of high population density were chosen for detailed engineering and environmental geological mapping. GEOSURV also embarked on the publication of the Geological Map Series at a scale of 1:1,000,000, starting in 1984. The published maps include: Geological,

Tectonic, Neo-Tectonic, Mineral Resources, Hydrogeological, Geomorphological, Gravity and Magnetic maps. In 1991, GEOSURV began publication of the 1:250,000 Geological Map Series.

Following the regional studies of Parsons Company in the 1950's, systematic hydrogeological mapping was initiated by GEOSURV to evaluate major groundwater basins. Water investigations were previously the responsibility of a small department within the Ministry of Irrigation who drilled wells to obtain water for drinking and agricultural use, generally with poor documentation. GEOSURV took responsibility for sampling and evaluating thousands of hand-dug wells during the regional survey program. A major shift in hydrogeological investigations began in the late 1970's when contracts were signed with international companies and national bodies (Yugoslav and Italian, GEOSURV and the Directorate of Ground Water) for hydrogeological evaluation of the groundwater basins of the Iraqi Desert (Desert Development Project). For the first time deep water, boreholes (up to 1600 m deep) were drilled and fully evaluated based on resistivity surveys and seismic profiles.