



## **Implications of Human Activities on the Shatt al Arab River and Khor al Zubair in City of Basra, Southern Iraq**

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Implications of Human Activities on the Shatt al Arab River and Khor al Zubair in City of Basra, Southern Iraq

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### Abstract

Environmental factors have had a significant impact in Southern Iraq since 1980. The Tigris and Euphrates rivers are the main source of fresh water in Iraq. The confluence of these two rivers forms the Shatt al Arab River near the town of Qurnah in Basra province besides Karkheh and Karun Rivers from Iran. There is no quota agreement between nations to share water, which has led to a water crisis in southern areas, particularly in the city of Basra. Over the course of two decades, human activities and conflict in the region have led to significant impacts on the soil, surface and groundwater in Southern Iraq. A major issue of concern is a high concentration of pollutants in surface and groundwater with heavy metal, dioxin and depleted uranium, especially in the city of Basra and its countryside. Release of contaminants, coupled with reduce water availability, mean assessment of water quality is critical for development in the area.

This study will assess the environmental impact of heavy metal contamination in the Shatt al Arab River and Khor al Zubair to determine the probable sources of pollution, environmental transport pathways and receptors, and to propose possible treatment methods. 66 Samples of estuary water have been collected and processed using the standard method of United States Geological Survey USGS or British Geological Survey BGS. The physical properties of the water samples were measured in field while all samples were analysed in laboratory for the major cations (Na, K, Ca, Mg) and anions (Cl, F, Br, NO<sub>3</sub>, PO<sub>4</sub>, and SO<sub>4</sub>) as well as the heavy and trace elements (Fe, Al, Mn, Li, V, Cr, Co, Cu, Ni, As, Zn, Mo, Se, Cd, Pb and U) to give an assessment of the water of Shatt al Arab and Khor al Zubair. The results showed that the values of TDS and EC were higher than the WHO standards especially in the Khor al Zubair water body. This reflects the sharp decline in fresh water from the Tigris and Euphrates Rivers and the diversion of the Karoon River into Iranian territory, causing the high salinity of the waters of the Shatt al Arab. The lack of drainage of the Hammar Marsh to Khor al Zubair in addition to the ingress of salt water from the Arabian Gulf during the tide. The lack of governmental attention to the environment and the lack of environmental awareness of the population and agricultural activity have had a significant impact on the deterioration of the Shatt al Arab and Khor al Zubair waters.