

THAR-RIFT AND ITS SIGNIFICANCE FOR HYDROCARBON

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The southeastern part of Pakistan is dominantly a desertic area and flood plains on the western margin of Indo-Pakistan subcontinent, known as the Thar Desert and the Lower Indus Plains respectively. The whole region is covered by dune-sands and Indus-Hakra rivers' floodsediments of Quaternary age. In view to develop tectonic inter-relationship, an integrated study has been carried out based on the seismic profiles, seismicity events and drilling data. The results of this study have indicated the presence of a fossil rift beneath the Thar Desert, which is named as Thar-Rift. The southeastern uplifted limb of this rift is potentially rich in coal. About 176 billion metric tons thick bedded lignite coal was discovered as a result of exploration activities under the collaborative program of Geological Survey of Pakistan, USAID and US Geological Survey during the last decade. On the other hand, several oil & gas field were discovered in Badin area of Lower Indus Plain in the western part of the Thar-Rift. This rift has been inferred as a monoclinial basement structural feature. The eastern (or SE) limb is uplifted, but the western (or NW) limb/part is subsiding gravitationally forming the Thar Basin. This subsided limb forms a series of faulted and tilted tectonic blocks favorable for the accumulation of hydrocarbons. It is also inferred that the divergent process would have provided favorable conditions for elevated temperatures imperative for thermal maturity of hydrocarbons within the basin, shallow-water depositional environments of the Mesozoic sediments which includes euxinic mud for source, shore-line sands in carbonates reefs for reservoirs, and argillites/evaporites (?) for seals in general as a result of Thar-Rift development. Moreover, The modern seismicity data indicate present-day re-activation of some of the faults associated with the rift.