

## The Himalayan Tectonic Framework and Possible Hydrocarbon Potential Entrapment Zones

Anshu K. Sinha

[anshuksinha@gmail.com](mailto:anshuksinha@gmail.com)

The Himalayan arc extends about 2,500 km from northwest to southeast incorporating from west to east the loftiest peaks, viz., Nanga Parbat (8125m), Everest (8,848m) and Namche Barwa (7,755m). The width of the belt varies from 250-350 km. The mighty Himalayas and Karakoram, embodying the largest concentration of lithospheric mass, grew south of the Pamir. The mountain zones consist geological record of Precambrian to Recent and terminates both east and west with spectacular syntaxial bends. In the last 100 Ma the collision of Asian and Indian plates is the most significant tectonic events in this part of the globe leading to the uplift of Himalayan mountain chain. This event has directly effected the changes in the orography of earth and consequent climatic changes. The prominent and terminal phase of suturing of Indian and Asian plates was marked by the closing of Tethys during 60-50 Ma. The crustal shortening caused the overthrusting and formation of extended thrust sheets forming klippen and nappe and root zones. The Himalayas is experiencing rapid uplift followed by erosion and deposition of sediments in the adjoining Arabian sea and Bay of Bengal. The recent discovery of ultrahigh pressure metamorphism (UHPM) having coesite mineral, and the transcurrent shift in the Karakoram fault zone are the significant research development in this area. Subduction processes in the active zone are responsible for tsunamis and earthquakes. The recession of glaciers in this region is concern for global climatic changes.

The zones of hydrocarbon bearing horizons are known only in the frontal belt south of Main Boundary Thrust (MBT). So far the success is limited to the discovery of natural gas only. The obvious reasons of not tapping the oil is the play of repeated thrust tectonics and its reactivation due to plate tectonics movements. The presence of hydrocarbon bearing shows of Salt Range Potwar Plateau in Pakistan and syntaxial area of Assam in India needs a further investigation. Drilling a deep hole in the northern sector of MBT in the central zone of the Himalayan Arc is strongly recommended, where the basement Riphean Carbonates and Tertiaries are entrapped by blind thrusts. There has been nodoubt appreciable efforts in this direction by ONGC, but a fresh look would perhaps add to our knowledge with fresh data available from different sources. But one should keep in mind the high play of temperature and pressure in the Plate Tectonic subduction Zone of Indian and Asian Plates.

Ref.

1. Book: Geology of the Higher Central Himalayas; Author- Anshu K. Sinha, John Wiley and sons, Chichester, 219pp, 1989.
2. Book: Himalayan Orogen and Global Tectonics, Publication no. 197 of the International Lithosphere Programme, Editor- Anshu K. Sinha, A. A. Balkema, 343pp, 1992.