

STRUCTURE AND TECTONICS OF THE SEISMICALLY ACTIVE KUTCH REGION, INDIA USING HIGH RESOLUTION AEROMAGNETIC DATA

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Kutch is demarcated as zone V in the seismic zoning map of India and the Bhuj earthquake of 26th January, 2001 with a magnitude of 7.8, is considered as one of the largest intraplate earthquakes. Major part of the basin is covered by the inaccessible Great Rann of Kutch and the little Rann of Kutch due to which the existing geophysical data coverage is very poor. To have a clear picture of the structural and tectonic frame work and understand the lithology of the region a semi detailed high-resolution airborne magnetic survey, at an altitude of 200m and line spacing of 1km, was conducted during the period January to May 2008, covering an area of 56593 sq. km over the Kutch basin and surrounding areas. The anomaly map depicts several major E–W, NE–SW and NW–SE oriented lineaments and faults, which are extending up to the Indian plate boundary. All major geologic and tectonic elements including the trap flows, the Kutch Main land Fault, the volcanic islands, extension of the Cambay basin towards north & Delhi-Aravalli towards the west, etc. find expression on the anomaly map. The shallow level magnetic sources are identified as trap flows and volcanic plugs. At deeper level, the whole region can be divided into two units corresponding to the Dharwarian and Delhi-Aravalli trends. These two tectonic units are separated by a NW-SE trending transition zone. Similar pattern is evident in the seismic tomography map at depths of 20 and 25km. Few magnetic and gravity profiles have been selected across this transition zone to throw light on its tectonic setting. Available MT, GPS, Gravity and Heat flow data have been utilized to arrive at a geodynamical model of the seismically active Kutch region. Results of this analysis will be presented.

Aeromagnetic data, Seismic activity, tectonics

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