



## **Paleoseismic evidence from trenches excavated across Allah Bund Fault and archaeological site in mesoseismal zone of 1819 Allah Bund earthquake, Great Rann of Kachchh, Gujarat, Western India**

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The Kachchh region in seismic zone V is not only well known for the occurrence of large magnitude earthquakes occurred in 1668 (M7); 1819 ( $M7.7 \pm 0.2$ ), 1956 ( $M_s 6.1$ ), and 2001 ( $M_w 7.6$ ), but also for having major Harappan (4000-4500 year) and historical sites. One of such major sites was Dholavira located on Khadir Island. Few sites in Great Rann of Kachchh (GRK), probably flourished until 1819 Allah Bund earthquake (?). Till date it is not fully understood as whether these sites were affected by the major seismic events in the past and also the presently evolved landscape was influenced by tectonic movements. The geologists, archaeologists, and scholars of ancient Indian history have mentioned the existence of numerous mighty southwest flowing rivers viz. the Sindhu (Indus), Shatadru or Nara (Sutlej) and Sarasvati, during Pre-Vedic and Vedic times ( $\sim 4000$  yr). These rivers flowed into then existing Arabian Sea, presently the GRK.

We excavated 6-8 trenches in Allah Bund region GRK. Study reveals occurrence of at least 3 major events during recent past, which were probably responsible for the disruption of major channels (?), changing the landscape and destruction of the settlements. Trenches on the hanging wall of ABF shows thick massive yellowish medium-fine sand overlain by 1-1.5 m thick laminated sequence of silty-sand and clay. This suggests change in depositional environment from fluvial to fluvial-marine or tidal environment (high sea-level during 4000-6000 yr?). Trench at Vigukot revealed prominent sand-sheets at three levels indicative of 3 major liquefaction events, triggered by near source earthquakes, the latest event probably be the 1819 Allah Bund.

Preliminary OSL ages of the sediments dated from the sand blow, soft sediment deformational structures, faulted sedimentary units from the trenches excavated on the hanging wall and across the Allah Bund Fault suggests occurrence of at least 2-3 events during 2.0-3.0 ka, with the most recent event during 2.0 ka.