Evidence of Tsunami Deposits and Land-level Change from the West Coast of South Andaman, Andman Nicobar Island, India

Javed N Malik[1], Chiranjib Banerjee[1] M. Shishikura[2], S. M. Hussain[3], Afroz A. Shah[1] and Onkar Dikshit[1]

[1]*Department of Civil Engineering, IIT Kanpur. Kanpur 208016. UP. India*
Email: javed@iitk.ac.in; chiroban@iitk.ac.in; afroz.shah@gmail.com, onkar@iitk.ac.in;
[2]*Active Fault and Earthquake Research Center, National Institute of Advanced Industrial Science and Technology (AIST), Site C7, 1-1-1 Higashi, Tsukuba 305-8567, JAPAN*
E-mail: m.shishikura@aist.go.jp
[3]*Department of Geology, University of Madras, Guindy Campus, Chennai-600 025*
E-mail: smhussain7@hotmail.com

Sedimentary records studied from the geo-slicer and trench sections collected from the west coast of Andaman Island around Collinpur village (N11°39′56.9″; E92°44′31.3″) revealed excellent evidences pointing towards land-level change and tsunami deposition caused by major earthquakes during recent historic past. In total we excavated 4 trenches and collected 9 geo-slicer sections along the transect crossing the stable beach ridges and swales between the ridges (N11°41′38″; E92°35′52″). We present here our preliminary results and interpretations. Based on sedimentary structures, grain size and nature of contact and colour, sedimentary units from the trenches and geo-slicers were classified into seven units *(a*, *b*, *c*, *d, e*, *f, g and h*) from bottom to top. The bottom most unit *a* is marked by poor laminations of fine silty-sand and peaty material suggestive of inter-tidal to marshy environment. This is overlain by 30 cm thick unit *b* – comprising coarse sand with gravel fragments (corals, shells, rock clasts etc.) in the swale and coarse sandy deposits along with broken shells, peaty material and rip-up clasts of underlying soil on the back-limb of the beach ridge. The sharp contact with the underlying and overlying sedimentary units, distinct variation in grain marked assorted fragments, broken shells and peaty material suggests deposition by tsunami wave during recent geological past. Overlying unit *c* marked by partially developed peaty layer suggests marshy environment at or above mean sea-level indicative of a probable uplift (?) which occurred during Event-I accompanied with tsunami waves. Unit *d* with finer deposits comprised of silty-clay suggests deposition under sub-tidal environment; change of depositional environment from marshy to sub-tidal suggests subsidence – Event-II. Thick silty-sand unit (unit *e*) and overlying humic soil (unit *f*) of 2004 indicates land-level change. Based on the change in sediment grain size and well develop humic soil it is suggested that the uplift was gradual during inter-seismic period. Unit *g* shows yellowish medium to coarse sand with prominent laminations at the basal part and sharp contact with the underlying humic soil (unit *f*). This unit marks the deposition by recent tsunami generated by 2004 Sumatra-Andaman earthquakes. Marginal coseismic

subsidence probably occurred during this event of 2004 (Event-III). The unit *h* marks the present soil developed in the swale after 2004 event capping the tsunami deposit.

AMS ages obtained from the peaty material, charcoal and wood from the geo-slices and trench sections suggest that Event-I marked by tsunami deposits occurred at around 1200-1300 AD; Event-II marked by subsidence occurred somewhere during 1300-1800 AD. It is inferred that the gradual uplift during inter-seismic period occurred between 1800 and 2000 AD. Finally the area marginally subsided during 2004 Sumatra-Andaman earthquake along with deposition of tsunami sediments Event-III.