Geophysical Research Abstracts
Vol. 12, EGU2010-2380, 2010
EGU General Assembly 2010

Structural implication of drainages on the frontal part of the Eastern Syntaxis region of Arunachal Himalaya, India

Mrinalinee Devi Rajkumari and Pabon Kumar Bora

North East Institute of Science & Technology (formerly Regional Research Laboratory), Jorhat, Assam, India; email-mrinalineerk@rediffmail.com

Abstract

Siang Antiform, which is a continuation of the Namche-Barwa Antiform of the Eastern Syntaxis of the Arunachal Himalaya is followed intensely by the Siang River with a knee-bend turning. Shortening occurs along the frontal part with the presence of fault-propagating fold structure and subsequently evolving into an emergent ramp stage. Around the Pasighat area, the Siang River is found to be avulsing its channel in a large scale. The channel width from 300m to 500m becomes avulsed into a wideness of more than 10km from nearby the Pasighat town onwards. Recent shifting of the Siang river channel by a distance of about 1km towards northeast to eastern direction is observed all along the right bank of the Siang river channel from Pasighat onwards. The shifting indicates the prolific anticlockwise movement of the Indian Plate under the HImalaya. Higher order Siku River (6th order stream) confluences with the antecedent Siang River abruptly at right angle. Siku River follows a transverse fault trending NNE-SSW direction. Knee-bend turning of the Siang River is also observed nearly 2.5km downstream of Rengging village due to the passing of the Main Boundary Thrust (MBT) across its river channel along the NE-SW direction. Radial drainage is exhibited, in the thin patches of Siwalik domain, by the tributaries of the Bome and Sippi Korong streams, indicating the underlying domal structure just north of the Himalayan Frontal Thrust (HFT) related with the proximal tectonism of the Himalayan Foreland Basin. Radial drainage is also observed north of the Bodak and Aeying Village, north of the MBT, which has been formed related to the plate adjustment of the Eastern Syntaxis. NNE to SSW flowing Sibo Korong stream deflects for about 1.65 km along an ENE-WSW trending fault nearby the Balek village, whereas the stream itself already followed a NNE-SSW trending structural trend following part of Mingo Thrust, which brought the Middle Siwaliks over the Upper Siwaliks, along its channel. Assymmetrical drainage, having Trillis pattern on one side, and Sub-dendritic on the other side, exhibits structural controlling nature of the drainages. Rectangular and angulate drainages are mostly observed in the higher order river channels, whereas Sub-dendritic to Sub-trillis drainages are quite common in the lower order stream channels. The study area is seismically very active and also experiences heavy landslides along the fault/thrust alignments indicating activeness of these structural features. Both MBT and HFT are folded in the Pasighat area with respect to the Eastern Syntaxial Bend (ESB). The great 1950 Assam-Arunachal earthquake with magnitude 8.6 occurred in the ESB region and the study area comes under the Zone V of the earthquake prone region. With the advent of the Holocene climate the drainages of the tectonically disturbed study area had given rise to active erosion and denudation of the Siang Antiform and the surrounding areas of the ESB and meandered channels become deeply entrenched.
Keywords: Eastern Syntaxis; Frontal Arunachal Himalaya; Knee-bend turning; Siang Antiform; MBT; Himalayan Foreland basin