



Active morphotectonics of the southern intraplate Shillong Plateau (Bangladesh/India)

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Digital Elevation data and high-resolution satellite images have been used to identify lineaments, faults, geomorphic indices and other fluvial responses in order to better understand of young, uplift, exhumation, and erosional activities of the seismically active Shillong Plateau in E India. Lineament patterns along the Dauki Fault of the southern margin of the Shillong Plateau are influenced by fault strike and indicate that the effect of tectonic activity decreases to both the western and eastern termination of the fault from a central active fault part. The active regions are characterized by low values of mountain front sinuosity and valley floor width to height, and high values of stream gradient index and drainage density. The calculated geomorphic indices and other fluvial responses support the idea that the rugged topography and v-shaped valleys are not only a product of monsoon climate-driven erosion but also strongly influenced by active tectonics along the fault zone. The drainage basin (catchment area) asymmetry, 3D stream network, and transverse topographic symmetry factor suggest a differential uplift in different zones have been effective to build the present landscape. Lateral strike slip movements have been identified along the fault zone, allowed the tectonic blocks spaced re-orderly with in a N-S shortening setting. Successive faulting parallel to the main Dauki Fault facilitated greater uplift in the northern parts where basement rocks were uplifted at about 2 km from sea level. The Dauki Fault segmented into five distinct parts at its eastern termination displaying a horse-tail structure geometry. One part of Dauki Fault, which is located below alluvium cover south of the Shillong Plateau in Bangladesh, is mechanically responsible for Tertiary sediments deformed into a monocline. The Dauki Fault has a complex evolution in space

and time, and is closely associated with the growth and exhumation of the Shillong Plateau.