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# Fluvial Facies Architecture in Small-Scale River Systems in the Dupitila Formation, Sylhet Town, Northeast Bengal Basin, Bangladesh

Bengal Basin, at the northeast corner of the Indian plate, is a famous petroliferous basin of the Southeast Asia. The present study is from the Sylhet trough, a sub basin within the Bengal Basin, that accumulated 18 km thick clastics. At the late stage of the basin-fill history 3-km thick Pleistocene strata (Dupitila Formation), fluvial in origin, has been deposited in a foreland basin setting. The very upper part of the Dupitila Formation is exposed near the Sylhet town in small hillocks. Detailed facies analysis was carried in four of these hillocks. Four facies have been identified- trough cross-bedded medium sandstone (St); ripple cross-laminated very fine to fine sandstone (Sr); finely laminated mud with ripple cross-lamination (Fl); and massive mud with rootlets (Fm). These facies are so vertically arranged that small-scale fining-upward cycles (average 4.5 m thick) can be easily identified. Embedded Markov chain analysis shows two significant cycles- an active channel comprising facies St, Sr, and Fl; and sheet-flood/crevasse splays comprising facies Sr and Fm. Vertical cliff faces of the studied hillocks offer 2D architectural element analysis in which dominant paleoflow was from northeast to southwest. Facies architectural elements include channel (CH), lateral accretion (LA), sandy bedform (SB), and overbank fine (OF) that show poor vertical and lateral connectivity of the sand bodies. Average channel depth is 5m with sand body geometry ranges from tabular, sheet, to shoestring. The net to gross ratio of the studied succession is 0.45. The present study shows that the Dupitila Formation of the Sylhet trough comprises small-scale meandering river deposits. Facies architecture presented here is crucial in attacking the arsenic problem in Dupitila aquifer of Bangladesh, and also can be used as analog for fluvial reservoir heterogeneity elsewhere in the world.