



## **Knee-bend turn and compressed meandering on the Pam and Papum River due to tectonic forcing on the Sub-Himalaya of the Arunachal Himalaya, India**

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“Knee-bend turn and compressed meandering on the Pam and Papum River due to tectonic forcing on the Sub-Himalaya of the Arunachal Himalaya, India”

Abstract

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The Pam and Papum River gets originated from the Lesser Himalayan region, passes through the Sub-Himalaya and confluences at an obtuse angle in a prong shape, guided by ENE-WSW, WNW-ESE trending lineaments and join the mighty Brahmaputra River as the Burai River after following more or less as a straight channel, from the north. It follows NE-SW to NW-SE trending lineaments. These rivers show compressed meandering and take knee-bend turnings on its river flow from north to south. Papum Syncline with its axial trend of ENE-WSW passes through the river channels of these rivers. The Pam River channel shows upright beddings on its left bank, as the Tippi Thrust, in which the Lower Siwaliks thrust upon the Middle and Upper Siwaliks, passes through the river channel had truncated northern flank of the Papum syncline. Structural elements of folding and fault movements disturbed the Pam and Papum River channels, leading to compressed meandering. With the onset of Tippi thrust, the north to southward flowing Pam River changed its course by taking knee bend turning from NW-SE to E-W to ENE-WSW direction following the fault trend. Columns of upright sandstone and pebbly beds protruded have also been observed along the left bank of the Pam River. Structural control of the river channel is also indicated by another set of the protruding sandstone beds observed on the right bank of the Pam River with no extension on the left bank is observed on its confluence with Jote Stream. Papum River also takes N-S to NW-SE channel with an obtuse angle turning guided by Tippi thrust and meets the Pam River in a Y-shaped joining along a 8km long NE-SW trending fault plane. Active tectonic activities uplifted Quaternary deposits of gravels, sand and silt in the study area. Left lateral movement is also evident from the offsetting of the Pam river at its confluence with Jote stream by about 300m. Intense activity of folding and faulting related to the proximal tectonics of the Himalayan foreland basin (HFB) are witnessed in the study area. The occurrence of syncline, anticline and thrusting along with strike-slip movement exhibit the shortening of the HFB as the Indian plate converges northward beneath the Himalaya. The Pam and Papum River are forced to deflect their path and undergoes compressed meandering guided by the structural elements of folds and faults in the Arunachal Himalaya due to proximal tectonism of the HFB.

Keywords: Sub-Himalaya; Compressed meandering; Papum Syncline; Tippi Thrust; Knee-bend turning; Himalayan Foreland Basin; Proximal Tectonics.