Physical Weathering and its Relation to Climate and Tectonics in Satluj River Valleys (Himachal Pradesh)

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Satluj, the largest river in Himachal Pradesh, is tectonically active, has massive topography and received high monsoonal rainfall. The valley is most suitable area to study the relation between physical weathering, tectonics and climate. Silt and discharge data were collected from four stations, located near major thrusts viz. MCT (Vaikrata Thrust) and STD in the Satluj River course. From silt and discharge data, the specific sediment yields were calculated. In our study, we found out that the Powari and Jangi area which are on or near the MCT and STD thrust respectively have more specific sediment yield. While Khab and Nathpa region, which lies far from the thrust, have low sediment yield. This infers that the erosion rate is higher in tectonically active areas near thrust. In Khab station which lies in glacial fed area and above the monsoon reaches, the specific sediment yield is low. While Powari and Jangi area which lie below the monsoon reaches have higher erosion rates and it is even higher in the vicinity of the MCT and STD thrusts. This infers that monsoon fed river parts of Satluj has higher erosion than glacial fed river parts and erosion rate even more is higher around the tectonically active areas. The relation between physical weathering and tectonics-climate is revealed in our work.

Keywords: Satluj River, sediment yield, erosion, tectonics, climate