Lineament and Drainage Network Analysis of The Potwar Area Using Digital Elevation Model and Digital Basement Terrain Model.

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This study focuses on utilizing Digital Elevation Model (DEM) and Digital Basement Terrain Model (DBTM) in order to constrain the structure of the Potwar area. Drainage responds rapidly to tectonic changes and thus they are potential parameters for tectonogeomorphological analysis. Drainage network of Potwar is a good geological record of movement of the plates, displacements of the tectonics, regional uplifts and erosion of tectonic unit. We extracted drainage network from DEM of the area and analyze 211 streams using stream power law. Spatial distribution of concavity and steepness leads us to prepare uplift rates map for the area. DEM and DBTM are further utilized to extract lineaments from both models respectively. Due to structural complexity of Potwar area, the results from DEM and DBTM do not provide sufficient information. For this reason we compare correlation between DEM and DBTM extracted lineaments with drainage network of the area respectively and got tremendous results. SWAN syncline divides Potwar into Northern Potwar deformed zone (NPDZ) and southern Potwar platform zone (SPPZ). Streams in NPDZ indicate high steepness values as compared to streams in SPPZ. Spatial distribution of concavity, steepness and uplift rates suggest the distinction between eastern, central and western parts. Rose diagrams of lineaments from Drainage Network, DEM and DBTM shows a bit different orientation which is the result of severe deformation. Local correlation between drainage network and lineaments from DEM is strongly positive in the area within 1 Km radius whereas for DBTM it is simply positive in 500 m radius range.