Semi-Automated Cartographic Techniques to Analyse the Geomorphometric Parameters in High Altitude Glacierised Terrain using SRTM DEM Data

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Natural geomorphological forms are formed by various surface natural agencies and their impact on considering area. Along with surface agencies, the tectonic forces originating deep below the earth's surface also change surface configuration, increase or reduce the rate of surface modification intensity. Hence, analyzing the characteristics of these parameters was utilized to differentiate the different environmental parameters of the rocks in various studies. In this study, the drainage and basin morphometric parameters were obtained from SRTM (Shuttle Radar Topographic Mission) DEM(Digital Elevation Model) data of the Central Himalayan region and analysed using Semi-automated cartographic techniques. The area is situated north of Main Central Thrust (MCT), which separates the metamorphic from underlying very low grades of un-metamorphosed sedimentary sequence of the lesser Himalayas. It has been observed that drainage morphometry derived from this Semi-automated technique follows standard rules. The high density of stream frequency and high drainage texture on surface of big glaciers indicate that glacier surface is not uniform in lower altitudes and these two parameters can be utilized in automatic mapping of the debris covered glaciers in Central Himalayas. Distribution of the relative relief along the major drainage at some locations show asymmetrical distribution, indicating active tectonics at such locations. Dissection index is low at high altitude and increases in downstream direction, indicating convex profile at higher altitude and concave at lower altitude. The convex profile does not help in active mobilization of the weathered material at higher altitude, while weathered material mobilization is quick at lower altitude. The whole valley is dominated by low value of Ruggedness index except a few places at downstream junctions of tributaries with main streams especially at lower altitude and main valley.