



Determination of Geomorphological Characteristics of Jakham River Basin using GIS Technique

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Abstract: This study was conducted for Jakham River Basin to understand the relationship between geomorphological characteristics and to delineate the various parameters depends upon the slope, geology of the basin, and elevation. Remote sensing and GIS observed as a most effective and time saving technique for determination of geomorphometric parameters. This methodology was found very relevant for extraction of morphometric parameters using ASTER DEM. The study involves morphometric linear, areal and relief aspects of Jakham river basin, which is a tributary of Mahi River in southern Rajasthan. The catchment area of river basin is 950km² with dendritic drainage pattern. It is divided in to four sub-watersheds. The geological set-up of the basin is represented by various igneous and meta-sedimentary rocks. The parameters which were worked out includes stream order, stream number, stream frequency, basin length, stream length ratio, bifurcation ratio, form factor, relative relief, circulatory ratio, elongation ratio, relief ratio, ruggedness number and drainage density. The stream order of the basin is mainly controlled by the physiographic condition. The mean bifurcation ratio ranges 3.28 to 4.02 indicate the effect of geological formations to the drainage pattern in the basin. Drainage density ($D_p=1.82\text{km km}^{-2}$) of the watersheds shows the course nature of drainage pattern and permeable for infiltration. Shape factor (circulatory and elongation ratio) indicates that sub-watersheds are less to moderate elongated in shape have less susceptibility to peak flood.

Keywords: Geomorphology, Morphometric, GIS, DEM, Linear, Aerial, Relief aspects
