

Morphometric Analysis of Drainage Basin through GIS: A Case study of Sukhna Lake Watershed in Lower Shiwalik, India.

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Abstract: Land, water and soil are limited natural resources and their widely utilization with increased population is a major concern. To mitigate the increasing demand of land and water resources, it is of prime important to conserve the natural resources for sustainable development. Morphometric analysis provides a quantitative description of drainage system which is an important aspect of watershed characterization. Morphometric analysis of Sukhna Lake watershed located in Chandigarh covering Punjab and Haryana was carried by using GIS technique. Survey of India topographic sheets in 1:50,000 scales and Arc GIS 9.3 software were used for analysis. Drainage map was prepared with the help of GIS (Geographic information System tool) and the Morphometric parameters such as linear, aerial and relief aspect of the watershed have been determined based on the formula suggested by Horton, Strahler,. The analysis of linear aspects of drainage basin shows that the basin has a dendritic pattern with fifth order stream. Bifurcation ratio of basin(4.113 to 4) falls under the range (3.0 and 5.0) in which the geologic structures do not distort the drainage pattern. Drainage density, drainage texture, elongation ratio and relief ratio value of Sukhna watershed was 3.435Km/Km² and 9.30 confirms that the study area is underlain by impermeable subsurface material of Siwaliks having sparse vegetation and hilly relief and steep slopes with very fine texture causes prone area of soil erosion risk in the Sukhna Lake watershed.

Key words: Morphometric analysis, GIS, watershed