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Morphometric Analysis and Prioritization of Sub-Watersheds in Bino Watershed, Uttarakhand: A Remote Sensing and GIS Perspective

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Abstract: In this study, morphometric analysis and prioritization of the nine sub-watersheds of Bino watershed, located in the North-Eastern part of the Ramganga river catchment in Almora and Pauri Garhwal districts of Uttarakhand State of India, was carried out using remote sensing and geographical information system (GIS). The morphometric parameters considered for analysis are stream length, bifurcation ratio, drainage density, stream frequency, texture ratio, form factor, circularity ratio, elongation ratio and compactness ratio. The Bino watershed has a dendritic drainage pattern. The highest bifurcation ratio among all the sub-watersheds is 3.476 which indicates a strong structural control on the drainage. The maximum value of circularity ratio and elongation ratio are 0.534 and 0.817, respectively for the SW7. The form factor values are in range of 0.164 to 0.524, which indicates that the Bino watershed has moderately high peak flow of shorter duration. The compound parameter values were calculated and prioritization rating of nine mini-watersheds in Bino watershed was carried out. The mini-watershed with the lowest compound parameter value is given the highest priority. The SW1 has a minimum compound parameter value of 4.22 is likely to be subjected to the maximum soil erosion; hence, it should be provided with immediate soil conservation measures.

Keywords: Watershed, GIS, Remote sensing, Morphometric analysis, Water shed