Abstract

Morphometric analysis of any watershed and its prioritization is one of the important aspects of planning for implementation of management programmes. Present study evaluates the quantitative morphometric characteristics of Nagmati River watershed in Kutch District of Gujarat by utilizing Cartosat-1 data (CartoDEM). In all 19 aerial and 6 linear morphometric parameters of the watershed have been evaluated. Drainage map of the study area reveals a dendritic drainage pattern with sixth order stream network comprising 492 numbers of streams and confining an area of 129.41 km². Mean bifurcation ratio ($R_b$) and stream length ratio ($R_L$) of the watershed evaluated are 3.44 and 0.54 respectively which corroborates the fact that drainage pattern is not influenced by the geological evolutions and disturbances in the recent past. The drainage density of 2.68 km·km$^{-2}$ indicates impermeable sub-soil material with sparse vegetation and moderate to low relief. Elongation ratio of 0.956 infers the basin to be closer to a circular shape. The geologic stage of development and erosion proneness of the watershed is quantified by hypsometric integral ($H_I$) bearing value as 0.5, indicating the landscape to be uniform and in early mature stage. The study prioritizes eight sub-watersheds as high, medium and low for taking up soil and water conservation activities. Hence, remote sensing applications proved to be highly useful in extracting the precise data for the evaluation and analysis of watershed characteristics.

Key words: hypsometric analysis, morphometric analysis, Nagmati watershed prioritization