



## **Quantitative morphometric analysis of Bilrai watershed, Shivpuri district, Madhya Pradesh using remote sensing and GIS**

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**Abstract:** Each and every River basin and watershed normally comprises a distinct morphologic region and have special relevance to drainage pattern and geomorphology. Morphometric analysis is based on certain quantities that are considered to characterize stream networks and drainage basin systems. These quantities are stream length, number of streams, bifurcation ratio, density of streams per unit drainage area, elevation difference, slope, and perimeter and area of drainage basins, etc. The surface stream patterns are usually influenced by the underlying lithology, geological structures, the topography and various hydrological factors. In the present work, IRS 1D LISS III satellite digital data and Geographic Information Systems (GIS) are used in order to calculate and accurately delineate the morphometric characteristics of Bilrai watershed with respect to the linear, areal and relief aspects. The conventional quantities mentioned above were extracted for the study area. The watershed was delineated and Strahler's technique is used to map the Bilrai watershed and detailed morphometric analysis. The extracted values were mapped and analyzed using statistical approaches and in a GIS environment to characterize the stream networks and drainage basin systems. The morphometric analysis reveals that the basin is of fifth order and drainage pattern developed in the area are mostly dendritic in nature. The results that are obtained on the basis of stream and drainage basin analysis provide valuable information for an improved understanding of hydrological characteristics in the study area.

**Key Words:** Morphometric, Bifurcation ratio, lithology, geomorphology, GIS