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Comparative Morphometric Analysis of Yelganga-Shivbhadra and Kohilla River Sub-Basins in Aurangabad District Maharashtra India

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Abstract : Morphometric analysis is the first stage of any basin analysis. By using these morphometric parameters we give indirect information about the nature and relations of stream with other streams, Geology of the area, groundwater condition and tectonic history of the basin. In the present study, Yelganga, Shivbhadra and Kohilla rivers, tributaries of the Godavari River in Aurangabad district, Maharashtra, India are considered to compare and study their morphometric characters. The linear, areal and relief morphometric aspects of the sub-basins have been assessed and evaluated in GIS environment. For this study, ArcGIS 10.1 software has been used for delineating, digitizing and generating different thematic maps. The Survey of India (SOI) toposheets maps and Shuttle Radar Topography Mission (SRTM) Digital Elevation Model (DEM) on resolution 30 m downloaded from United States Geological Survey (USGS) have been used for preparation of map and data generation. Geologically, the study area is covered by Central Deccan Volcanic Province (CDVP). It mainly consists of 'aa' type of basaltic lava flows of Late (upper) Cretaceous to Early (lower) Eocene age. The total geographical area of Yelganga, Shivbhadra and Kohilla river sub-basins are 185.5 sq. km., 142.6 sq. km and 122.3 sq. km. respectively The stream ordering method as suggested by the Strahler has been employed for present study and found that all the sub-basins are of 5th order streams. The average bifurcation ratio value of the sub-basins is below 5, indicates that there appears to be no strong structural control on drainage development, homogeneous nature of lithology and drainage network is in well-developed stage of erosion. The drainage density of Yelganga, Shivbhadra and Kohilla Sub-basins is 1.79 km/km2, 1.48 km/km2 and 1.89 km/km2 respectively and stream frequency is 1.94 streams/km2, 1.19 streams/km2 and 1.68 streams/km2 respectively, indicating semi-permeable sub-surface. Based on textural ratio values it indicates that the sub-basins have coarse texture. Shape parameters such as form factor ratio, circularity ratio and elongation ratio values shows that all three sub- basins are elongated in shape.

Keywords : GIS, Kohilla, morphometry, Shivbhadra, Yelganga
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