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MORPHOMETRIC ANALYSIS OF DON RIVER BASIN, VIJAYAPUR DISTRICT, KARNATAKA, INDIA USING REMOTE SENSING AND GIS TECHNIQUES

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ABSTRACT

The Don river is appropriate to the rivulets of Krishna River and course sat a span of 160 Km and overspreads nearby 1502.81 sq. Km. The present work covers an Indian Survey departmental toposheets number 47P/5, 47P/6, 47P/9, 47P/10, 47P/13, and 47P/14 and geographically bounded by latitude N16^{0}33'0.9324" – N16^{0}58'40.98" and longitude E75^{0}12'21.0204" – E75^{0}59'59.9892" in the Vijayapur district, Karnataka. Resembling flower patterned drainage framework is initiated in the basin. The base map was prepared by the toposheets also SRTM-DEM images were adopted for the arrangement of different thematic maps which were needed for the interpretation of the morphometric characters. The extreme stream order propositions as the fifth order stream. The divergence ratio of the Don River receptacle varies from 1.71-2.33, that appears as an indication of lower standards of sub-basins (I, II and III) which was least damaged by structural conflicts. The drainage density values in sub-basins vary from 1.16 - 1.35 per Km that suggests low drainage density. The drainage texture (ranges from 5.63 to 7.87) signifies moderate to fine drainage texture. The stream frequency (Fs) of respected areas of sub-basins which range from 1.72 to 1.85 per sq. Km indicates an appropriate connection with the drainage density of the descend, and it is inferred the stream populace increases. Lower value form factors are observed in sub-basins (I and III) suggesting that widened and platter peak flow for a lengthier period. The sub-basins I and II bearing a values of Rc less than 0.5 represent that those are widened, while the sub-basin III Rc value is bigger than 0.5 value suggests approximately circular in shape, severe to moderate relief of the drainage system is anatomically controlled. Its extended ratio of the sub-basin gradually increases from 0.51 (sub-basin I) to 1.42 (sub-basin II) with an average of 0.96 stipulates that the basin is elongated with high relief. The values of the area of overland flow fluctuates 0.31 to 0.39. The value of span of overland flow (Lo) is low that indicates high relief. The values of relief ratio differ from 0.002 to 0.006 which shows the higher part of basin devouring the gentle slope and comparatively higher infiltration capacity. The value of the relative relief in sub-basin II has minimum Rr (0.121), whereas sub-basin I partook the maximum value (0.147). The slope of the areas ranges from 2.170 % - 13.009 % which suggests that more the percentage of the slopes results in the increase of erosion, in case all the things are placed in stability form. The rate of infiltration of rainwater in the ground is less as the area receives low annual rainfall and also a major portion of the groundwater is used for agricultural activities. Due to this, the area is hit by severe water scarcity in the summer seasons. Hence, this has to recommend implementing the groundwater recharge schemes for the appropriate handling of the aquatic system.

KEYWORDS: Morphometry, Don River Basin, Remote Sensing and GIS

Original Article

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