www.ggsnagpur.org

ISSN : 2455-1953
JGSR
Journal of Geosciences Research
Vol. 2, No.1, January, 2017
pp.45 - 53

Morphometric Analysis of Karanja River Basin, Bidar District, Karnataka, India, using Remote Sensing and GIS Techniques

S. Manjunatha[1]*, Manjunath Dalwai[1], Raju Sukhaye[1], J. Davithuraj[2]

[1]*Department of Geology, Karnatak Science College, Karnatak University, Dharwad-580 001, India*
[2]*Central Ground Water Board, SUO, Belgaum-590 019, India*
**E-mail: manjunathas29@yahoo.in*

Abstract

In this study the detailed morphometric and drainage network analysis of Karanja river basin, a tributary of Godavari river, has been carried out by using remote sensing and GIS technique. The Karanja river basin (study area) is divided into six sub-basins based on the drainage network identified on the digital elevation model (DEM) of the area using Arc-GIS 10 software. Morphometric parameters like linear, aerial and relief aspects of the basin have been evaluated, which revealed that, the sub-basins exhibits dendritic and sub-dendritic drainage pattern. Low values of bifurcation ratio suggest that the area was not affected by structural disturbances, whereas low drainage density (0.8 to 1km^2) indicates highly permeable sub-soil and coarse drainage texture in the study area. The quantitative analysis in terms of form factor (0.27 to 0.57), circulatory ratio (0.33 to 0.51), elongation ratio (0.59 to 0.85) clearly indicates elongated shape of the sub-basins. Relief ratio that varies from 0.003 to 0.004 indicates gentle slope of the drainage basin. The slope map of Karanja river basin indicates that the major part of the area is very gently sloping (55.54%) to nearly flat (39.64%), however, around denudational hills, the terrain is steeply sloping. Hence, it is recommended to implement groundwater recharge schemes for proper management of water resources.

Keywords: Morphometric analysis, Karanja river basin, Bidar district, RS-GIS