

Morphometric Analysis of Ratnagiri Coast, Western Maharashtra, Using Remote Sensing and GIS Techniques

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Abstract

Morphometric characterisation of watershed helps in understanding the hydrologic processes, hydraulic properties of soil, terrain slopes and landform types that facilitates in prioritization of watersheds for sustainable development and management of natural resources. In the present study, morphometric analysis has been carried out in selected parts of Ratnagiri coastal area of Maharashtra, integrating remote sensing data and GIS techniques. This study exhibits the linear, areal and relief aspects of the nine watersheds and highlight the genesis of landforms and fluvial processes. In the study area, majority of the watersheds have structurally controlled development of drainage network, wherein, the drainage density is low to moderate for Talawadi, Saldure, Sanewadi, Digiwadi, Karde and Harnai watersheds indicating moderate to high infiltration rate, permeable sub-soil material and dense vegetation cover. The 'Dd' of Panchinadi, Sarwadi and Palande watersheds is high that indicates large proportion of the precipitation converted to surface runoff. The Harnai, Karde, Digiwadi, Talawadi and Palande watersheds reveal coarse to very coarse drainage texture, whereas Sanewadi watershed shows moderate texture, while Panchinadi, Saldure and Sarwadi watersheds depict fine to very fine texture. Circularity ratio of Karde and Digiwadi watersheds show elongated to less elongated shape and low peak discharge, whereas, Panchinadi, Sanewadi, Talawadi, Saldure, Palande and Sarwadi watersheds are circular in shape generating high peak discharge. The length of overland flow of all watersheds has low values that represent low degree of sheet erosion. Panchnadi and Saldure watersheds have very steep slopes, while remaining watersheds depicts moderate relief. The database of linear, areal and relief morphometric aspects generated for these coastal watersheds could be helpful for developers, planners and policy makers in formulating the strategies and designing the water and soil conservation plans.

Keywords: Morphometric analysis, Remote Sensing, GIS, Ratnagiri Coast, Maharashtra, India.