

## MORPHOMETRIC ANALYSIS AT MINIWATERSHED LEVEL USING GIS

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Hydrologists attempted to relate the hydrologic response of watersheds to watershed morphologic characteristics. Computation of watershed morphological characteristics is a prerequisite to further detailed hydrological analysis of the watershed. Watershed characterization involves computation of parameters that influence the characteristic behaviour of a watershed whereas analysis aims at the critical study of these parameters to arrive at conclusions on watershed response and behaviour. In the last two decades, watershed management has gained the top most priority in water resources sector necessitating delineation of watersheds upto mini watershed level in order to take up watershed development and management programmes. Kadam watershed is divided into two sub watersheds 4E3C4 and 4E3C5 in watershed atlas of India. In the present study, an attempt is made to delineate the Kadam watershed of Middle Godavari sub basin (G-5) of Godavari River Basin into eighteen miniwatersheds using GIS and morphometric analysis has been carried out at miniwatershed level. 4E3C4 subwatershed has further been delineated in GIS environment into eleven mini watersheds namely 4E3C4a to 4E3C4k and 4E3C5 subwatershed has been delineated into seven miniwatersheds namely 4E3C5a to 4E3C5g. The miniwatershed 4E3C5a (Kadam River) has been found to be of longest basin length with 44.46 km and 4E3C4g (Batkamma Vagu) miniwatershed was found to be with lowest basin length of 8.54 km. It is observed from the above analysis that the miniwatershed 4E3C5a (Kadam River) represented highest perimeter, area and basin length. The total length of all stream segments under stream orders I to VIII are found to be 1541.5, 689.63, 412.35, 243.5, 61.19, 54.23 and 3.09 km respectively. The total length of all streams for the entire watershed has thus been found to be 4691.23kms representing a dense drainage network. The highest Bifurcation ratio is found to be 11.95 for 4E3C5a (Kadam River subwatershed). The Batkamma vagu (4E3C4g) subwatershed is having the maximum Elongation ratio. The Maximum values of Circularity ratio of 0.642 and Drainage density of 3.510 have been found in Lothuvara subwatershed. The Maximum values of Stream frequency of 7.25 and Texture ratio of 15.81 have been found in Dorlavagu subwatershed. GIS could be effectively used for the computation of these morphological characteristics of the watershed with greater efficiency and accuracy.