

Executive Summary

UGC Sponsored Minor Research Project

Title of the Project : “Morphometric Analysis and Planning for Water Resource Development of the Wainganga River Basin Using Traditional & GIS Techniques”

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Department : Geography

Duration : Two Years

The main findings of the study are being summarized below:

- From the prepared contour map, the maximum and minimum elevations in the study area were found to be 880 m and 280 m respectively.
- The area height break-up indicates that a large proportion (46.62%) of the total area falls in altitudinal zone of below 280 meters followed by 281-480 meters (28.51%). Beyond these height-groups, the areal shares of the altitudinal zones decrease so much so that it is only 2.77% for above 880 meters.
- Slope map indicated Gentle to Precipitous slopes varying from 46.62 to 0.03 percent for the study area.
- It is 7th order drainage basin and total stream 9472 that included 1st 6502, 2nd order 6502, 3rd order 605, 4th order 153, 5th order 17, 6th order 4 stream. Mean Bifurcation Ratio 3.97,
- Number of Streams Segments 5232.97, length ratio (RL) 1.0001, Sinuosity Index 1.5 and drainage basin geometry shape mainly in sub dendritic to dendritic type.
- It is observed that the drainage density 0.66 and Drainage Frequency 0.19 value is low which indicates the basin is highly thick vegetative cover and permeable sub soil.

- The Basin Circularity ratio 0.38 and Elongation Ratio 0.12 reveal that the basin is strongly elongated and highly permeable homogenous geologic materials.
- The Tamia hills are highest 1,148 m (3,765 feet) height above Mean Sea Level point in the study area it means Absolute Relief is 1,148 m. This study would help the local people to utilize the resources for sustainable development of the basin area.
- The rainfall data shows that mean annual rainfall varies from 1097 mm in western part to 1541 mm in the eastern part. The standard deviation varies from 422.73 mm to 164.40 mm.
- The coefficient of variation (CV) varies between 0.21 to 0.40. The analysis of the rainfall concluded that the zones of usually heavy rainfall are the zones of least variability and zones of lower rainfall are the zone of higher variability
- The annual mean rainfall ranges from a maximum of 1830.50 mm at Shivni in Gadchiroli District, to a minimum of 1000.07 mm at Sitekasa in Nagpur District. However it mostly varies from 1000 mm to 1400 mm.
- Earliest analysis of the rainfall data shows that mean annual rainfall varies from 1097 mm in western part to 1541 mm in the eastern part. The standard deviation varies from 122.74711 mm to 485.59166 mm, respectively.
- The skewness varies between -.049 and 1.650, predominantly positive skewness with average around .913 indicating that annual rainfall during the period is asymmetric and it lies to the right of the mean over all the stations.
- Kurtosis varies from -.415 to 3.329 with an average around 2.000. The coefficient of variation (CV) varies between 15066.853 in Nagpur and 235799.256 in Gadchiroli district with an average coefficient of variation 20.97% in the entire basin. Opening analysis of the rainfall concluded that the zones of usually heavy rainfall are the zones of least variability and zones of lower rainfall are the zone of higher variability.

- The area under cultivation in the sub-basin is 682040 ha (682.04 thousand ha.). Around 13% of the net sown area is under irrigation. This includes all sources of irrigation like dam, wells, canals, tube wells and tanks. The current total irrigation potential created through surface water is 682040 ha. (i.e. 13% of the net sown area) and the current total live storage created is 4133.57 Mm³.
- Apart from the projects mentioned above, there are fourteen hydropowers projects proposed in the Wainganga Project Area with a total capacity of 49.35 MW and will be completed by 2015.