

# **WATER UTILIZATION AND MANAGEMENT OF THE WAINGANGA RIVER SUB BASIN BY USING GIS AND REMOTE SENSING TECHNIQUES**

## **Summary of Minor Research Project**

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University Grants Commission  
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## SUMMARY

The main findings of the study are being summarized below:

- The average annual rainfall is about 150 cm, but it has great spatial variations. This variation found in Grid 20.25<sub>0</sub> to 80.25<sub>0</sub> have highest rainfall 1059.38 mm and in the 20.00<sub>0</sub> to 80.25<sub>0</sub> lowest rainfall is 640.57 mm in the year of 1961 to 1970. In the 1971 to 1980 decade found of the highest rainfall 1001.31 mm in 21.75<sub>0</sub> to 80.00<sub>0</sub> grids and also 640.57 mm lowest rainfall occurs reference to grid 20.75<sub>0</sub> to 80.25<sub>0</sub>. In the decade of 1981 to 1990 highest rainfall is 1097.10 mm and lowest rainfall 672.44 mm in 21.50<sub>0</sub> to 80.00<sub>0</sub> and 21.25<sub>0</sub> to 80.50<sub>0</sub> respectively. The recent 24 years the maximum rainfall 1248.46 mm and minimum rainfall 616.56 mm found that area 21.50<sub>0</sub> to 80.00<sub>0</sub> and 21.75<sub>0</sub> to 78.50<sub>0</sub>.
- According to Strahler's scheme of Stream Ordering in Wainganga basin is 7<sup>th</sup> order drainage basin and total stream 4870 that included 1<sup>st</sup> 3318, 2<sup>nd</sup> order 1117, 3<sup>rd</sup> order 331, 4<sup>th</sup> order 88, 5<sup>th</sup> order 11, 6<sup>th</sup> order 4 stream.
- The Wainganga River basin total means Bifurcation Ratio is 3.55 that is a natural river system where uniformity is seen with respect to climate, rock type and stage of development.
- In the Wainganga River having sinuosity index more than 1.41 is defined as meandering. Drainage basin geometry shape mainly in sub basin of Wainganga is dendritic to dendritic type.
- High Flood Site of the river Wainganga at Bhandara (Maharashtra) is flowing at 248.65 m against the danger level of 244.50 m and the highest flood level (HFL) at 249.10 m attained on 07/09/1994, with a rising trend. River Wainganga at Pauni (Maharashtra) is flowing at 229.72 m against the danger level of 227.73 m with a rising trend. In the flood year of the 2005 in Gondia district 30 to 35 villages have been affected by the floods. 3,000 people have been shifted to safer locations and accommodated in 30 relief camps at the time of disaster the district administration is distributing food material to the affected families.
- Loose surface soil, heavy monsoon rain, tortuous river courses, and flatness make unique geographical unit. Most part of the region is densely populated. Wainganga River characterized by numerous cutoff channels and hills. Sandbars are developed within the channel as well as in the convex side of meanders. Natural levees are formed at the edge of point bars bordering the channel.

- The floodplain of Wainganga River especially in the confluence with Bagh- Wainganga, Sur-Wainganga, Kanhan-Wainganga, Khobrgarhi-Wainganga etc. has undergone considerable changes in the last 55 years.
- The resulted changes in this way include downstream migration of meander, widening of river course and removal and deposition of sandbars. The processes involved in changes of river morphology in Wainganga are avulsion, bank retreat and neck cut-off. Various ripple mark also found in bed channel Turka, Nerla, Pawani, Gudhegaon, Mangali in Bhandara district. Ladaj, Nawargaon, Chkhalgaon, Kururetc in Chandrapur districts. Shivni, Algaon, Armori, Dewalgaon, Katalietc in Gadchiroli district.
- The Wainganga River and its tributaries carry huge amount of sediments at the monsoon season. They are deposited whenever the water is out on the banks. The coarse sediments thus deposited reduce soil fertility. Breaches in Khobragarhi, Kanhan, Kathani, PENCH and Wainganga are very common in this region, indicating the limited level of protection that the embankments provide.
- Flood forecasting plays an important role in flood mitigation plan. Flood forecasting refers to prediction of crest and its time of occurrence and logical extension to the stages of river above a specified water level called the warning level, which is one meter below the danger level.