



## Study of Rainfall Variation Pattern In Hathmati Basin

\*Dr. S.K.Dave \*\*Dr.N.J.Shrimali \*\*\*Mr.D.K.Parmar

\* Sr. Lecturer B.B.I.T, Vallabh Vidyanagar, Gujarat

\*\* Associate Professor, Civil Engg. Dept., Faculty of Technology & Engineering, The M.S.University of Baroda.

\*\*\* Sr. Lecturer B.B.I.T, Vallabh Vidyanagar, Gujarat

### ABSTRACT

Water is a vital natural resource which forms the basis of all life. The finite nature of renewable fresh water makes it a critical natural resource to examine in the context of population growth. Gujarat falls in the sub-tropical climatic zone. Sabarmati is one of the major river of North Gujarat. It is a major west-flowing river and flows for 48 km in Rajasthan before entering Gujarat. The Sabarmati River has five tributaries Hamav, Hathmati, Watrak, Wakal and Sei. Hathmati is one of the major tributary of Sabarmati. Here an attempt has been made to carry out analysis rainfall pattern of Hathmati river basin.

**Keywords :** Obesity, percentile, breast feeding.

### INTRODUCTION :

The Hathmati River rises from the Gujarat Malwa hills south western foothills of the Rajasthan range near Godad at a north latitude of 23° 55' and an east longitude of 73° 29' in Sabarkantha district. After traversing a course of 98 km, it meets the Sabarmati River near village Ged, 20 km south west of Himatnagar in Sabarkantha district. The catchment area of Hathmati River including its tributaries is 1,574 sq. km. The two main tributaries of Hathmati are Bodoli and Guhai having catchment areas of 119 and 505 sq. km, respectively. The average annual rainfall in the catchment is 860 mm.

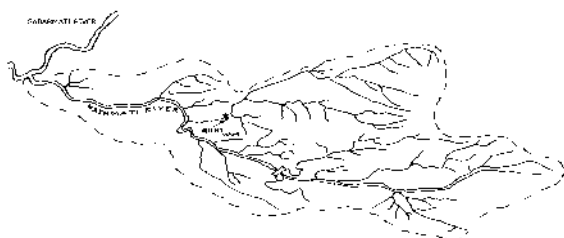


Figure 1: Hathmati Basin

### ANALYSIS :

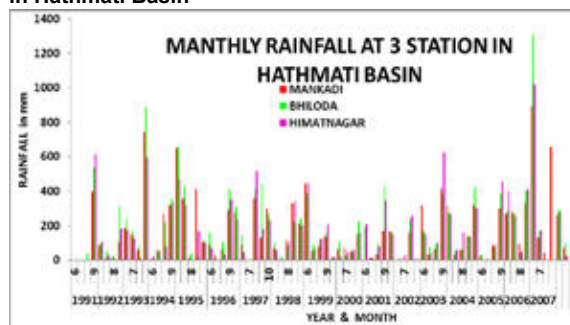
Annual rainfall is the only source of water in the basin. This rainfall causes runoff and ground water recharge. The catchment characteristics vary across the basin. Slopes are moderate, especially towards South Western parts of the catchment. There are five rain gauge stations provided and maintained by different agencies at Bhiloda, Mankadi, Himatnagar, Lalpur and Pal. It is observed that amongst five rain gauge stations three stations namely Mankadi, Bhiloda and Himatnagar are exactly located in study area covering significant part of it. These three station's data have been used to find out Weighted Mean Rainfall (WMR) for the basin and use in analysis.

**Table – Rain Gauging Stations Located in Hathmati River Basin**

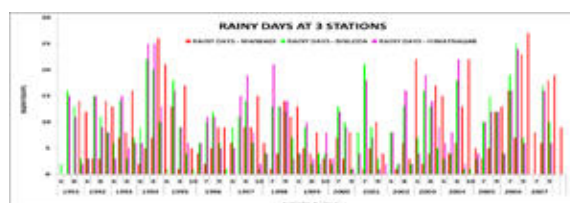
Sr. No.	Name of Rain Gauge Stations	Lat	Long	Ref Toposheet No
1	Bhiloda	23°46'10"	73°24'45"	46A14
2	Himatnagar	23°36'00"	72°57'50"	46A14
3	Lalpur	23°37'10"	72°55'45"	46A14
4	Mankadi (Hathmati Dam)	23°42'00"	73°13'10"	46E02
5	Pal	23°58'02"	73°17'00"	46E05

The study area comes under the influence of South-West monsoon. The spatial variation in the rainfall is highest for Hathmati basin amongst all sub-basins of Sabarmati basin. The year to year variations in rainfall is also very high. The coefficient of variation in the rainfall varied from 41-63%.

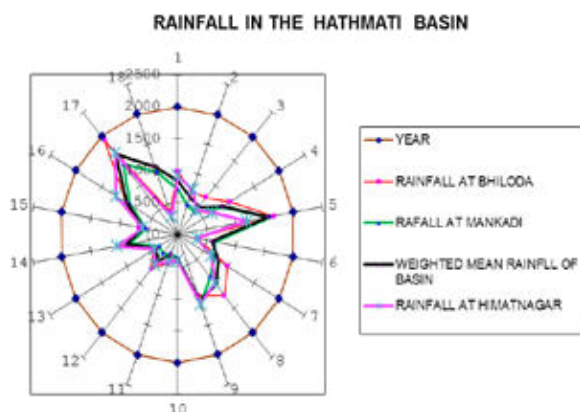
**Graph 1 : Variation of annual rainfall at different stations in Hathmati Basin**



**Graph 2 : Variation of monthly rainfall at three stations in Hathmati Basin**



**Graph 3 : Variation of rainy days at three stations in Hathmati Basin**



### CONCLUSION :

In Hathmati basin maximum mean annual rainfall is 920 mm in Dehgam and the minimum mean annual rainfall values are observed 780 and 601 mm in Khedbrahma and Hadad respectively. One significant feature of rainfall characteristic of Hathmati basin is that rainfall is highly erratic. Major part of the total annual precipitation is received during three months July, August and September only. The number of rainy days and maximum daily rainfall also varies in a high range. The distribution of the rainfall over the basin is highly non uniform. The rainfall varies over the basin from a value as high as nearly 1000 mm to as low as around 600 mm in the same year. Perhaps the best example of this could be year 2007. This year some part of the basin received rainfall nearly 300 mm to 400 mm to more than 1000 mm in other part of the basin. The coefficient of variation in rainfall varied from 41-63 %. The drought condition is observed for an average of 40 % period while severe drought observed for a period around 10 % or less. This indicates the strange hydrological behaviour of the area is because of non uniform distribution and erratic nature of the rainfall rather than the less rainfall.

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