

## RAINFALL DISTRIBUTION AND VARIATION IN SATARA DISTRICT

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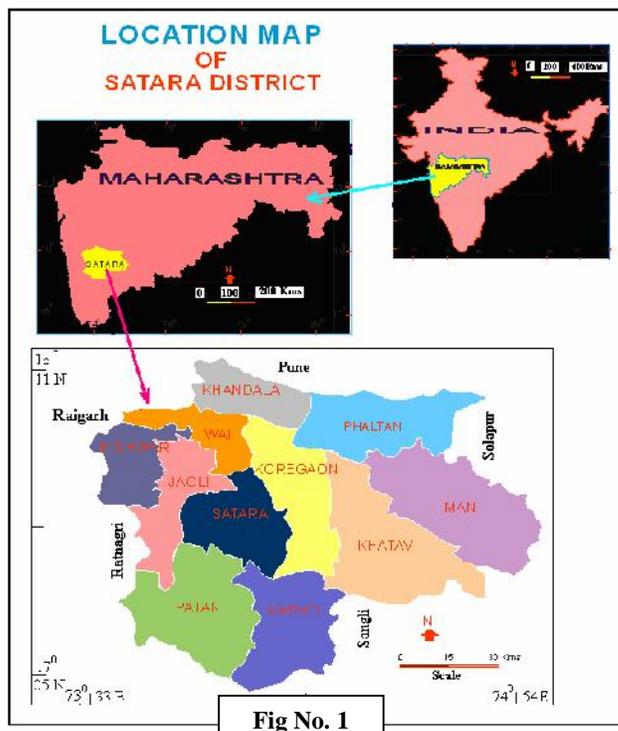
### INTRODUCTION:

Water is a basic requirement of human being and is also the basis of all types of development. So, we can say, it is a life. Rain is a primary source of water. Rain water is available from rivers, canals, tanks and underground resources like wells and bore-wells. Rainfall should be regarded as the fundamental so far as progress of the society is concerned. Rather it has always been treated as a fundamental sector for the total development of the society. Rainfall is very important and primary ecological parameter. It has created a variety of farming enterprises. It is a dominant single weather element infusing the intensity and location of farming system and the farmer's choice of enterprises. It also becomes a climatic hazards to farming where it is characterized with scantiness, concentration, intensity variability and unreliability.

### OBJECTIVE:

1. The present study is spatio-temporal variation in rainfall of Satara district.
2. Study and identify the rainfall zones in study region.

### STUDY REGION:



Study area is one of the districts of Maharashtra states. The district has a slight circular shape and it is located in the Nira and Krishna basin. This district is located between 17°5' to 18°11' north latitudes and 73°33' to 74°54' east longitudes and occupies an area of 104584.89 sq. kms. The study region lies in the southern Maharashtra and administratively consists 11 *tehsils* which is Mahabaleshwar, Javali, Patan, Khandala, Wai, Satara, Koregaon, Karad, Man, Khatav and Phaltan (fig.1). For administrative purpose the district is divided in to four sub divisions Koregaon, Satara, Phaltan and Wai. According to census 2011 the district includes 1745

inhabited villages. The study region has 3003922 population. The length of region east to west is about 144 kms. and north to south 122 kms. Administratively it is bordered by Pune



district on the whole of the northern side, by the Sholapur district on the east, by the Sangli district on the south-east, and the Ratnagiri district on the west only over a length 44 kms.

The Ratnagiri district is bordered on the north-west side. Although the boundaries of the district are mainly administrative along several lines, this coincides with physical features. The study region extends between the *Sahyadrian* spurs on the west and the Mahadev range on the east.

The daily mean maximum temperature range between 28°C to 35°C and minimum temperature ranges between 15°C to 25°C. The highest temperature is recorded in the month of May. The average annual rainfall is registered 1350mm (2011). The soil of the district is essentially derived from the deccan trap. The soil of the district is shallow, medium and deep.

#### DATA BASE AND METHODOLOGY:

Present study mostly relies on the secondary data collected through district statistical department of Satara, district socio-economic abstract of Satara district and census hand book of Satara district. Some data is collected through IMD (Pune) publications. For the present investigation, the district is selected as in a general and thasils in particular. The actual rainfall changes of specific decades are obtained by dividing the differences between 1982 to 2011. The collected data is analyzed by statistical and cartographic techniques.

#### ANALYSIS:

Satara district is mainly divided in two broad regions, one is western and second is eastern. This region is divided by *sahyadri* mountain range. The eastern part come under the rain shadow area, yet an average annual rainfall is 1350mm (2011). The western part of the district gets slightly more rainfall than the east of the district. Most of the rainfall received during the south-west monsoon during June to September.

This rainfall account for about 80 per cent of the normal annual rainfall and near about 15 per cent of the rainfall in the district during post monsoon or retreating monsoon season during October to December. The rest 5 per cent annual rainfall is received during the pre monsoon along with thunderstorm.

Distribution of the monsoon in the district is unequal from part to part and ranges between 500mm to 6000mm. The western mountain *tehsils* including Mahabaleshwar, Patan, Wai and Javali receives 2500mm to 6000mm rainfall, which can be called heavy rainfall zone. The rainfall decreases rapidly from western part toward the eastern side. The central plain zone including *tehsils* Satara, Karad and western part of Koregaon lie in moderate rainfall zone. The north-eastern part of study region including Phaltan, Khandala, Man, Khatav and eastern part of Koregaon *tehsils* receives below 1000mm rainfall and lies in the eastern low rainfall zone. Eastern part of the study region is drought prone area which lies in the rain shadow area, whereas the most eastern part of Man, Khatav and Phaltan *tehsils* receives rainfall below 500mm. It is drought prone area and always shortage of drinking water.

**Table 1, Satara district average annual rainfall (1982 – 2011)**

Sr. No.	Year	Average Annual Rainfall in mm	Sr. No.	Year	Average Annual Rainfall in mm
1	1982	1304.9	16	1997	2318.7
2	1983	1821.9	17	1998	1975.6
3	1984	1911.2	18	1999	1566.9



4	1985	1487.9	19	2000	1502.0
5	1986	1528.7	20	2001	1281.4
6	1987	1487.3	21	2002	1316.8
7	1988	2214.4	22	2003	1015.2
8	1989	1724.4	23	2004	953.0
9	1990	2027.3	24	2005	1530.3
10	1991	1927.4	25	2006	1362.1
11	1992	1791.3	26	2007	1142.5
12	1993	1579.9	27	2008	862.1
13	1994	2531.9	28	2009	1358.6
14	1995	1445.9	29	2010	1375.1
15	1996	1940.8	30	2011	1315.0

Source: IMD- Pune- Monsoon Reports

#### Temporal Variation in Rainfall:

The variation in the annual rainfall from year to year is quite large due to unpredictable and erroneous nature of monsoon. The average annual rainfall is between 1300mm to 2100mm. It shows that Satara district is located in moderate area but regional rainfall variation is more. Hence some parts receive heavy rain and some part low rainfall. Intensity of rainfall is more effective for the farm system and crop productivity because of its insecurity and invariability. Table no.1 shows that the average rainfall of Satara district changes from year to year. The average annual rainfall in Satara district is 1350mm (2011). About 80 to 90 per cent of the annual rainfall in the district is in the south-west monsoon season. The rainiest month being July the variation in annual rainfall in Satara district is recorded in 1988, 1994 and 1997. In three years high rainfall that is 2214.4mm, 2531.9mm and 2318.7mm respectively. The low annual rainfall in Satara district is in 2003, 2004 and 2008 that is only 1015.2mm, 953.0mm and 862.1mm respectively. Here the rainfall in these thirty years decreases from 1982 to 2011.

#### Spatial Variation in Rainfall:

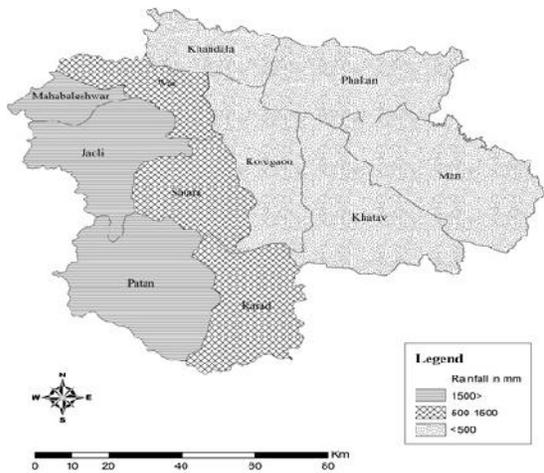
The rainfall of Satara district is moderate but very uneven. The distribution of rainfall in Satara district is characterized by three types of rainfall region;

**Table 2, Rainfall Distribution (average annual rainfall in mm) 2011**

Sr.No.	Tehsils	Rainfall in mm
1	Mahabaleshwar	6555.3
2	Wai	903.6
3	Khandala	443.8
4	Phaltan	311.9
5	Man	242.2
6	Khatav	393.9
7	Koregaon	514.9
8	Satara	851.9
9	Javoli	1721.0
10	Patan	1909.6
11	Karad	617.3

Source: Department of Agriculture Pune

Rainfall Distribution  
(Average annual rainfall in mm-2011)



**Fig No. 2**

1. High Rainfall Region (Rainfall More Than 1500 mm):

The highest rainfall tehsils in Satara district is Mahabaleshwar and in this thasil 6555.3 mm rainfall was received in 2011. Patan and Javali are considered in this range of rainfall region. This area is located in the western part of Satara district.

2. Medium Rainfall Region (Rainfall between 500 mm to 1500 mm):

The medium rainfall region is bounded between 500 mm to 1500 mm rainfall. In this range of rainfall Wai, Satara and Karad tehsils are included. This area is

located in the central plain zone. But this region is more irrigated by Krishna river basin.

3. Low Rainfall Region (Rainfall Less Than 500 mm):

The rainfall less than 500 mm is in low rainfall region. The Man tehsils is the lowest rainfall tehsils in Satara district. In this tehsils only 242.2 mm rainfall recorded in 2011. Hence, this tehsil suffers a more critical condition of drought. The Khatav, Phaltan, and Khandala tehsils are also low rainfall tehsils and in these tehsils 393.9 mm, 311.9 mm and 443.8 mm rainfall is recorded in 2011. In these tehsils we find, always shortage of drinking water and low developed agriculture.

**CONCLUSION:**

Satara district has a very uneven rainfall distribution. Average annual rainfall of the district is 1315.0 mm (2011) but the more disparity is available between western part of district is high rainfall region and eastern part is drought prone area. The low annual rainfall in Satara district is in 2008 that is only 862.1 mm and high rainfall in 1994 i.e. 2531.9 mm. The highest rainfall tehsils in Satara district is Mahabaleshwar and Man tehsils is the lowest rainfall tehsils in Satara district.

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