

Research Papers



**RAINFALL VARIABILITY IN SOLAPUR DISTRICT OF MAHARASHTRA:
A GEOGRAPHICAL STUDY**

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Abstract

The study area is located in the drought prone areas of Solapur district in western part of the Maharashtra. Thus annual rainfall conditions differ from region to region. In spite of the technological developments in providing improved crop varieties and better management practices in Solapur district, agriculture has been considered a gamble as the agricultural productivity is strongly influenced by the vagaries of the monsoon. The drought prone area in the district on annual rainfall occurs once in five years. The average annual rainfall is 561 mm. The computation of eleven tahsilwise annual rainfall use help of mean, S.D. and coefficient of rainfall variability shows the choropleth map. This attempt has been made to 2000 to 2010 annual rainfall in Solapur district.

Introduction:

Agriculture is one of the most important activity engaging more than 70 per cent of the population in India. The problem of raising enough food for millions is of vital importance. Indian economy is inextricably linked with the monsoon and it's prosperity is entirely dependent on amount of rainfall receive during monsoon. The success or failure of crops in any year is closely linked with the behavior of the monsoon most of the subdivisions of India receive 90 to 95 per cent rain from south-west monsoon. In order to increase agricultural production effective utilization of water resources is of prime importance. The rainfall variations is largely because of relief variations, synoptic conditions, movement of the monsoon through. Rainfall in the grater part of India is uncertain, erratic, vagaries of monsoon and unevenly distributed. Rainfall is the major parameter influencing agriculture activity of man. Rainfall is the dominant single weather element

influencing the intensity and location of farming system and the choice of enterprise.

In Soalpur district is average annual rainfall 561 mm. The government of Maharashtra and Central government declared total eleven tahsil district drought prone areas. This attempt has been made to 2000 to annual rainfall tabulation and use help of mean, standard deviation and coefficient of rainfall in Solapur district.

Study Area:

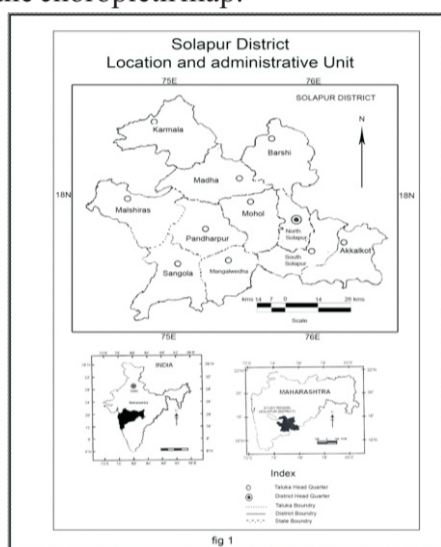
Solapur district is an administrative district in the State of Maharashtra in India. The district headquarter are located at Solapur is bounded by 170 10' to 180 32' north latitudes and 740 42' to 760 15' east longitudes. The total geographical area of Solapur district is 14,895 sq. km. divided into 11 tahsils and total population of 38,55,383 as per 2001 census (Fig.1). Climate of Solapur district is dry as daily mean maximum temperature range between 300c to 370c and

minimum temperature range between 180c to 210c with the highest temperature about 450c in the month of May. The annual average rainfall is 678 mm in Solapur district. In this district vegetation are scattered short thorny trees, bushes grow along with tree. These trees have long system and few small leaves. Short grasses, grow during rainy season

Objectives:

The present study has been undertaken with following specific objectives.

1. To study the annual rainfall during the year 2000 to 2010.
2. To find out coefficient of variation and shows the choropleth map.



Data Base and Methodology:

The present study is based on the rainfall data collected from Indian Metrological Department for eleven years, Agricultural Statistical Information State, Socio-Economic Review Solapur District, and Agricultural District Office. The data has been collected from 2000 to 2010. The trend of rainfall is calculated and represent by mean, Standard Deviation and Coefficient of Variability of Rainfall in Solapur district shows the presentation of result choropleth cartographic method is used. For the data analysis following formula has been used.

Formula =

$$C.V. = \frac{S.D.}{Mean} \times 100$$

Where,

C.V. = Coefficient of variability of rainfall

S.D. = Standard Deviation of rainfall

Mean = Mean of rainfall

Annual Rainfall Distribution:

Rainfall is a prime important factor, considered by influences the agricultural economy of the region. It is also determine the cropping pattern, performance of different agricultural and cultural practices. The marked differences in it's regional distribution has given rise to the disparity in the development of agriculture.

Distribution of rainfall in the different varies from part to part and ranges between 455 millimeters in Malshiras talhsil and 642 millimeters in Barshi talhsil (Table No 1 and Fig. 1 & 2) shows that the mean annual rainfall and coefficient of variability of rainfall during the year 2000 to 2010.

The average annual rainfall for Solapur district is 561. 41 millimeter. It is found that high rainfall occurs in Barshi talhsil 642.65 mm. and Mangalwedha talhsil 615.33 mm. Medium rainfall in North Solapur and South Solapur 584.13 mm, Pandharpur 592.43 mm and decreasing rapidly towards western part of the Malshiras talhsil 455.64 mm., then Mohol talhsil 511.35 mm. and Madha talhsil recorded 518.70 mm., Karmala talhsil 531.54 mm. The coefficient of variation is 18.86 per cent North Solapur, South Solapur and 18. 56 per cent Akkalot talhsil. While western border of Malshiras talhsil 46,48 per cent comes variability of rainfall the Karmala talhsil 35.49 per cent. In order to understand variation in yearly amount of rainfall, the yearly rainfall is grouped into five categories namely very high, high, medium, low and very low rainfall year on the basic of mean and standard deviation. The yearwise categories of low, medium and high rainfall are studied for one decade (Eleven year) from 2000 to 2010.

Table No 1
Tahsil wise mean rainfall and variability of rainfall of Solapur District
2000 - 2010

Year	North Solapur	South Solapur	Akkal-kot	Barshi	Pandharpur	Mangalwedha	Sangola	Malshiras	Madha	Mohol	Karmala
2000	586.3	586.3	745	782.4	554.2	372.6	505.9	263	630.7	652.9	940
2001	629.8	629.8	568	601	545.8	454.1	482.8	371	367	519	472
2002	582.3	582.3	516	480.7	403.3	583	642	296	355	415.1	364
2003	300.2	300.2	344	338.4	954.6	322.2	377.8	107	308.9	217.6	194.9
2004	603.8	603.8	445.7	488.9	532.8	711.4	379	388.5	469	429.5	522.4
2005	697.6	697.6	588.6	757.5	519.7	756.4	369.6	324.3	631	538.2	571.3
2006	453.1	453.1	551.1	659.6	474.8	623.9	560.6	437.2	487.3	588.1	608.8
2007	582.9	582.9	542.4	916.3	605.3	954.7	716.5	651.1	617.4	638	340.2
2008	634.3	634.3	424.8	670.3	469.2	529.5	499.3	596.5	600.3	595	715.7
2009	680.9	680.9	567.2	706.9	730.8	736.9	683.6	788.7	632.8	519.1	556.3
2010	674.2	674.2	567.2	667.2	726.2	723.9	667	788.7	606.3	512.4	561.3
Mean	584.13	584.13	532.73	642.65	592.43	615.33	534.92	455.64	518.70	511.35	531.54
S. D.	110.15	110.15	98.89	153.02	149.44	178.43	122.77	211.77	120.43	117.57	188.64
C. V. in %	18.86	18.86	18.56	23.81	25.23	29	22.95	46.48	23.22	22.99	35.49

Source: Agricultural District Office and Season and crop Reports

It is found that very high rainfall one decade in mean annual rainfall Barshi and Mangalwedha tahsil. High rainfall South Solapur, North Solapur and Pandharpur tahsil recorded 584.13 mm. and 592.43 mm. Medium rainfall recorded in one decade Malshiras tahsil, low rainfall recorded Akkalkot, Karmala and Sangola tahsil and very low rainfall recorded Mohol and Madha tahsil (Fig. 2 and Fig.3). It is found that high rainfall in Barshi tahsil comes to Standard deviation and coefficient of variability of rainfall 23.81 per cent. Normal rainfall is studied during the year 2000 high rainfall 782.40 mm, further decreasing of rainfall 2001 to 2004 601 mm to 488.90 mm. respectively. After decreasing of rainfall during the year 2005 rainfall 757.50 mm. then decreasing of rainfall 659.60 mm. In which almost the district experience drought conditions namely 2001 to 2004. While during four years of the period frequently of low rainfall. In Malshiras tahsil recorded 107 mm scanty rainfall during the year 2003. In Karmala tahsil recorded 194.90 mm during the year of 2003. During this period most of the Mohol, Madha, Sangola Mangalwedha tahsils have 217.60 mm, 308.90 mm., 377.80 mm and 322.20 mm respectively. It is very interesting to note that for Malshiras tahsil the recorded low rainfall. Barshi, pandharpur, Madha, Mohol coefficient of variability of rainfall equal percentage of years under very high and very low category. Moreover in 2007 was found as wettest 954.70 mm recorded high rainfall in Mangalwedha tahsil. This is followed by 916.30 mm in Barshi tahsil recorded high rainfall. It is also interesting to note that when this year in Karmala tahsil only 340.20 mm. lowest recorded of rainfall for the rest of the tahsil North Solapur and South Solapur 582.90 mm and equal rainfall respectively.

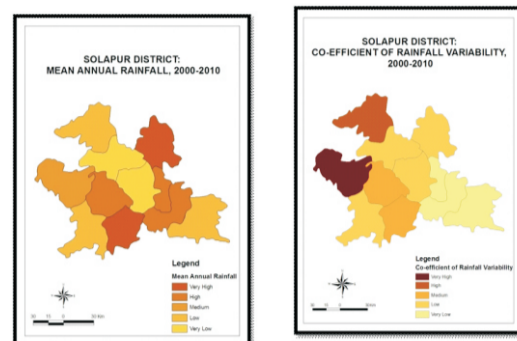
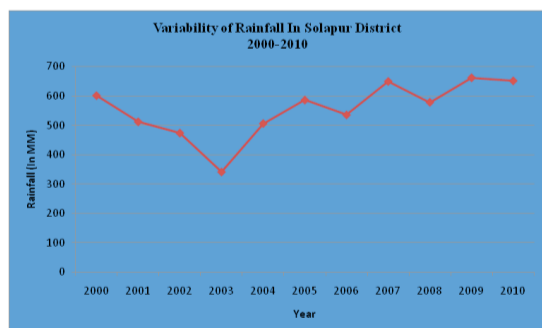


Table No 1 and Fig.4 shows that the coefficient of rainfall variability during the period of 2000 to 2010 in Solapur district. The highest variability of Malshiras tahsil 46.48 percent followed by 35.49 per cent in Karmala tahsil. Barshi, Pandharpur Sangola, Madha and Mohol tahsil comes equal coefficient of variation 22.95 to 29 percent respectively. Lowest coefficient of variability of rainfall North Solapur and South Solapur 18.86 percent.

Conclusion:

This paper is an attempt to study typical annual rainfall one decade in Solapur district. The study region received 561.47 millimeter annual average rainfall in the study region. The variation of rainfall has found in Malshiras tahsil in the year of recorded 107 mm and highest rainfall recorded in Mangalwedha tahsil during the year 2007 respectively mean annual rainfall and variability of rainfall is not uniform in all part Solapur district. Barshi tahsil has received highest 642.65 mm mean annual rainfall where Malshiras tahsil 455.64 mm mean annual rainfall. Rainfall variability affected agricultural practices in Solapur district. Hence under irrigated area and Bhima river basin perennial crop are cultivated in central part of the district. The lowest rainfall crop are cultivated bajra, horticulture, jawar and pulses in Sangola, Malshiras and Madha tahsil.

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