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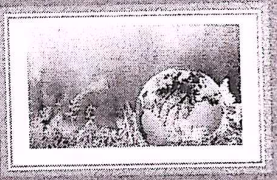

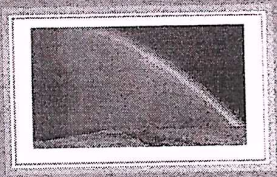

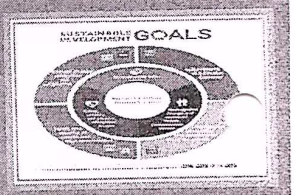

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Spatial Analysis of Rainfall Intensity in Kolhapur District: A Climatological Study

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Abstract:
Intensity is defined as the amount of rainfall regimes per unit of time. In theanalysis of rainfall intensity, the times may be considered in terms of hours andminutes. The hourly or daily rainfall intensity can be calculated according to thepurpose of the study. In the present study, the rainfall intensity is computed as perrainy days.Kolhapur district has wet tropical type of climate. The main objective is to the spatial analysis of Rainfall Intensity in Kolhapur District.Present study generally depends on the Indian Metrological Department data. There has used data in fourteen different IMD rainfall stations in the Kolhapur district.In the Kolhapur district during the 1988 to 2019 the annual rainfall intensity is various from 48.35mm/day atGaganbawada to 13.89 mm/day atShirol.The maximum rainfall intensity occurred along the high range of Sahyadri in the western part of the district and decreasing intensity of rainfall is eastern side.

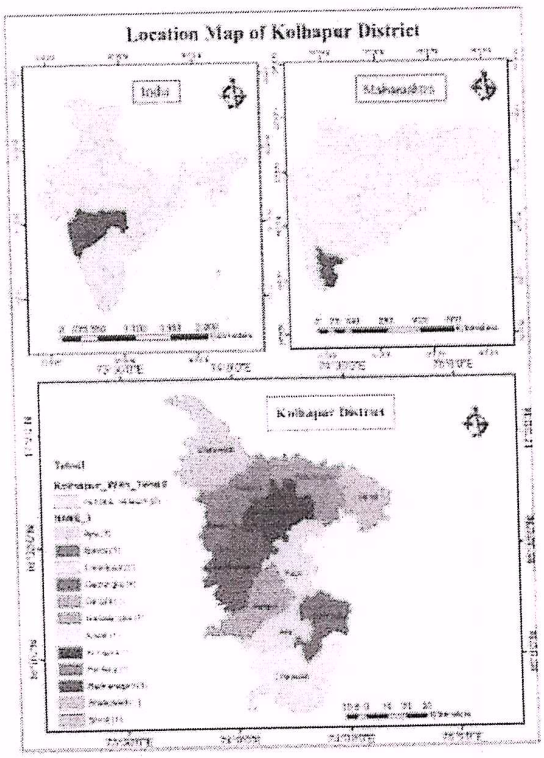
Key Words:*Rainfall, Intensity,Kolhapur district,South west monsoon.*

Introduction:

The rainfall intensity is important for the analysis of rainfall study about thewater availability and agricultural systems. The variability in the rainfall intensity isincreased to the problems of drought, infiltration, flood, evaporation, soil erosion andrunoff. Intensity is defined as the amount of rainfall regimes per unit of time. In theanalysis of rainfall intensity, the times may be considered in terms of hours andminutes. The hourly or daily rainfall intensity can be calculated according to thepurpose of the study. In the present study, the rainfall intensity is computed as perrainy days. The intensity is ratio of total amount of rainfall and number of rainy days.The rainy day considered the rainfall is equal or above 2.5 mm per day. Annual,seasonal and monthly rainfall intensities have been calculated for 1988-2019 in theKolhapur district (Table No.01).

Study Area:

The district of Kolhapur lies in the south-west of Maharashtra between 15°43'to 17° 17'North latitude and 73°40'to 74° 42'East longitude and spreads across the Deccan Plateau in the rain shadow region of the Sahyadri mountain ranges on the southernmost tip of the state of Maharashtra. The Sangli district lies to the north, the Belgaum district of Karnataka State is to the east and south, Ratnangiri and Sindhudurg districts of Maharashtra are to the West. To the west, we have the Sahyadri ranges and the river Warana is to the north which forms the natural boundariesto thedistrict



It has an area of 7685.00 sq.kms. Whichabout 2.5 per cent is of total area of the state and it ranks 24th in the state as far as area is concerned.Kolhapur district has wet tropical type of climate. In the summer's temperature ranges in between 24°C to 34°C, and in winter temperature ranges from 21°C to 27°C.

Objective of Paper: This Research paper has main objective is tothe spatial analysis of Rainfall Intensity in Kolhapur District.

Database and Methodology: Present study generally depends on the Indian Metrological Department data. There has used data in fourteen different IMD rainfall stations in the Kolhapur district.It has used 31 years rainfall data for analysis of Rainfall Intensity. It has used of MS-Excel software for calculation and Cartographic representation. It has made Interpolation maps in Arc GIS-10.8

software. The annual, seasonal and monthly rainfall intensity ofthe district is computed by using the following formula.

$$I = \frac{P}{N}$$

Where,

I= rainfall intensity
P=total amount of rainfall
N=number of rain days.

Data Analysis and Interpretation:

Figure No.01:
Annual and Seasonal Rainfall Intensity in Kolhapur District. (1988-2019)

Sr. No.	Station	Annual	SWM Season	PM Season	Cold Season	Hot Season
1	Ajra	22.97	24.00	16.20	8.23	17.05
2	Chandgad	29.20	31.01	18.54	13.78	18.52
3	Gadhinglaj	14.66	14.52	15.86	67.30	13.03
4	Gaganbawada	48.35	51.57	25.50	13.70	23.99
5	Hatkanangale	14.23	13.18	19.19	9.75	18.54
6	Gargoti	20.43	20.54	16.49	13.69	13.87
7	Kagal	14.22	14.19	15.85	11.11	11.25
8	Kolhapur (Obsy)	15.52	15.54	16.58	12.99	13.80
9	Panhala	20.61	21.36	17.10	9.30	10.42
10	Radhanagari	36.48	38.47	20.34	8.92	17.34
11	Shahuwadi	24.63	25.79	17.40	16.61	15.32
12	Shirol	13.89	12.97	17.21	14.48	16.11
13	Bhudargad	19.55	17.89	14.07	6.73	15.48
14	Karveer	15.36	14.46	16.75	6.31	14.56

(Source: Indian Metrological Department's rainfall data. SWM= Southwest Monsoon, PM= Post Monsoon.)

Annual Rainfall Intensity Figure No.01(A)shows the distribution of annual rainfall intensity over theKolhapur district. During the annual rainfall, intensity is various from 48.35mm/day atGaganbawada to 13.89 mm/day atShirol. The intensity is decreased towards the eastern direction. Maximum rainfall intensity occurred along the high range ofSahyadri in the western part, ranging between 20.61 mm/day to 48.35 mm/day. TheGaganbawadastation has showed the highest intensity ofrain. In the eastern side of district, the intensity is ranging from *13.89* mm/day to 14.66mm/day.

Seasonal Rainfall Intensity: Kolhapur district has four seasons; south west monsoon or rainy season (June to September), post monsoon or retracting monsoon (October to November), cold or winter season (December to February) and hot or pre monsoon season (March to May).

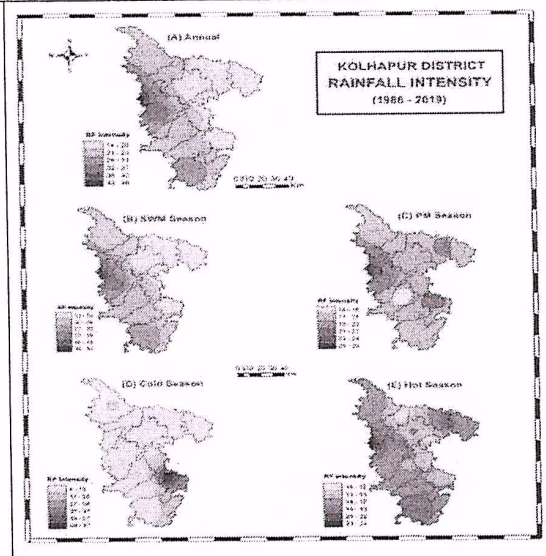


Figure No.01(B) shows the distribution of Southwestern monsoon season rainfall intensity over the Kolhapur district.During the Southwestern monsoon season rainfall, intensity is various from

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51.57mm/day at Gaganbawada to 12.97 mm/day atShirol. The intensity is decreased towards the eastern direction. Maximum rainfall intensity occurred along the high range of Sahyadri in the western part of the district, ranging between 17.89 mm/day to 51.57 mm/day. The Gaganbawadastation has showed the highest intensity of rain. In the eastern side of district, the intensity is ranging from 12.97 mm/day to 15.54 mm/day.The Shirol station has showed the lowest intensity of rain. Figure No.01(C) shows the distribution of post monsoon season rainfall intensity over the Kolhapur district. During the post monsoon season rainfall, intensity is various from 25.50mm/day at Gaganbawada to 14.07 mm/day atBhudargad. The Gaganbawadastation has showed the highest intensity of rain. The Bhudargad station has showed the lowest intensity of rain. Figure No.01(D)shows the distribution of Cold season rainfall intensity over the Kolhapur district. During the post monsoon season rainfall, intensity is various from 67.30mm/day at Gadhinglaj to 6.31 mm/day atKarveer. The Gadhinglaj astation has showed the highest intensity of rain. The Karveer station has showed the lowest intensity of rain.Figure No.01(E) shows the distribution of Hot season rainfall intensity over the Kolhapur district. During the post monsoon season rainfall, intensity is various from 23.99mm/day at Gaganbawada to 10.42 mm/day atPanhala. The Gaganbawada astation has showed the highest intensity of rain. The Panhala station has showed the lowest intensity of rain.

Conclusions:

1. In the Kolhapur district, Spatial variation and Seasonal variation found in intensity of rainfall in the Kolhapur district.
2. The maximum rainfall intensity occurred along the high range of Sahyadri in the western part of the district and decreasing intensity of rainfall is eastern side.
3. TheGaganbawada station has showed the highest annual intensity ofrain(48.35mm/day)and Shirolstation has lowest annual intensity ofrain (13.89mm/day).
4. TheGaganbawada station has showed the highest southwestern monsoon season rainfall intensity (51.57mm/day) andShirolstation has lowest southwestern monsoon season rainfall intensity (12.97mm/day).
5. The Gaganbawada station has showed the highest post monsoon season rainfall intensity (25.50mm/day) and Bhudargad station has lowest post monsoon season rainfall intensity (14.07mm/day).
6. TheGadhinglaj station has showed the highest cold season rainfall intensity(67.30 mm/day) and Karveer station has lowest cold season rainfall intensity(6.31 mm/day).
7. TheGaganbawada station has showed the highest hot season rainfall intensity(23.99 mm/day) and Panhalastation has lowest hot season rainfall intensity(10.42 mm/day).

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