Rajasthan Climate and Natural Vegetation

Climate: Long term phenomenon taking place in the atmosphere surrounding earth is called climate. Climate is decided on the basis of average of approximate 30 years conditions.

Climate of Rajasthan: The climate of Rajasthan varies from dry to sub-humid monsoon type. The dry climate full of high daily and annual range of temperature, low rainfall, hot scorching Loo and sandstorms are the climatic characteristics of western Rajasthan whereas comparatively low temperatures, low range of temperature and slightly higher rainfall are the characteristics of sub-humid climate to the east of the Aravallis. Latitudinal location, distance from sea, altitude above sea level, location and direction of Aravallis, soil structure and vegetative cover are the major factors which affect its climate.

Classification of Climate:

1. **General Climate Classification-** Classification has been done on the basis of rainfall.

S.No.	Climate	Rainfall (in cm)	Physical/Geographical Area
1	Arid	0 – 20	Western Desert Area
2	Semi Arid	20 – 40	
3	Sub Humid	40 – 60	Aravalli Range
4	Humid	60 – 80	Eastern Plain
5	Maximum Humid	80 - 120	Hadoti Plateau

2. **Individual Climate Classification-**

   A. **Koppen climate classification:** The Koppen climate classification divides climates into four main climate groups in respect of Rajasthan, with each group being divided based on vegetation.

S. No.	Climate Group	Climate	Vegetation	Extension
1	Aw	Humid/Maximum Humid	sawana	Banswara, Pratapgarh, Dungarpur, Kota, Baran, Jhalawar
2	BWhw	Arid	Xerophytes	Major parts of Jaisalmer, Bikaner, Minor parts of Ganganagar, Hanumangarh, Churu.

3	BShw	Semi-Arid	Steppe	Jalore, Barmer, Jodhpur, Pali, Nagaur, Sikar, Jhunjhunu, Hanumangarh and Ganganagar
4	Cwg	Sub – Humid	Monsoon	Alwar, Ajmer, Bharatpur, Boondi, Bhilwara, Karauli, Chittor, Dholpur, Dausa, Rajsamandh,Sawai Maddhopur, Sirohi, Tonk, Udaipur and Jaipur .

Note:

- BShw is Koppen's largest climatic zone.
- Dense agriculture is done in Cwg zone.

B. Trewartha Climate Clissification:

Basis Of Classification – Rainfall

Types – 04

S.No.	Koppen	Trewartha	Rainfall (in cm)
1	Aw	Aw	100
2	BWhw	BWhw	10
3	BShw	BShw	30
4	Cwg	Caw	70

C. Thronthwaite Climate Classification: Classified on the basis of Temperature, Evaporation and Rainfall.

S.No.	Climate Group	Climate	Extension
1	CA'w	Humid/Maximum Humid	Banswara, Pratapgarh, Dungarpur,Kota, Baran, Jhalawar
2	DA'w	Semi - Arid	Alwar, Ajmer, Bharatpur, Boondi, Bhilwara, Karauli, Chittor, Dholpur, Dausa, Rajsamandh, Sawai Maddhopur, Sirohi, Tonk, Udaipur and Jaipur .
3	DB'w	Mixed Climate (Arid and Semi-Arid)	Ganganagar, Hanumangarh, Churu, Bikaner
4	EA'd	Dry or Arid	Jaisalmer, Barmer and western part of Jodhpur.

- Thornthwaite Climate Classification is the most accurate climate classification.
- DA'w is the largest zone of Thornthwaite Climate Classification.

Climate Season Classification: - The twelve months period can be divided into three main seasons in Rajasthan- summer (March - June), Monsoon (rainy) season (June - September), Autumn Season (October and November), winter (December - February).

A. Summer Season - With the advancement of the sun towards Tropic of Cancer in northern hemisphere in March, temperatures begin to rise. The sun shines vertically in the month of June over the Tropic of Cancer which passes through the southern part of the state. The average temperature remains between 30 °C to 36 °C in most of the state due to dry, sandy soil. At some places, day temperatures may go up to 48° C. Days are extremely hot. Body starts parching. Fierce loo and sand storms are frequent. Nights are pleasant. Humidity is also considerably reduced. The climatic extremities are lower in the eastern Rajasthan as compared to the west.

i) **Loo –** Hot and dry winds blowing in summer season. Major Area – Barmer district.

ii) **Dust Storm -** also called sandstorm. The presence of moisture has enabled the winds to carry rain along which has created the current dust storm conditions. In Shri ganganagar dust storm blows for 27 days continuously.

iii) **Dust Cyclone** – Dusty and Cyclonic winds. District – Bikaner.

Note:

- The Phenomenon of summer season which increase Temperature – Loo
- The Phenomenon of summer season which decrease Temperature – Dust Storm
- Most hot month of summer season in Rajasthan – June
- Most hot place of Rajasthan in summer season – Falodi (Jodhpur)
- Most hot district of Rajasthan in summer season – Churu

B. Rainy/Monsoon Season - Whole of the state is heated by June resulting into the reversal of pressure and wind direction. Monsoon reaches Rajasthan by the end of June or beginning of July. It receives rainfall by both- The Arabian Sea branch and Bay of Bengal branch.

Rajasthan has considerable less rainfall because of the Aravalli range lies parallel to the direction of Arabian sea branch and fails to interrupt this branch of monsoon. However, in the Southern part of Aravalli, the mountains have slight east – west span thus Mount Abu in south receives highest rainfall.

- The Arabian Sea branch brings monsoon first in Rajasthan.
- Maximum rainfall in Rajasthan is brought by Bay of Bengal branch.
- Easterlies – Monsoon winds coming from Bay of Bengal in Rajasthan. They bring maximum rainfall to the eastern part of Rajasthan.
- Monsoon first arrives on 15th June in Dungarpur and departed from Rajasthan on 27th September.
- Maximum rainfall received by Jhalawar district and Minimum in Jaisalmer
- Average rainfall in Rajasthan – 57.50 cm

The factors that are responsible for the low rainfall despite the fact that both the branches of monsoon reach the state are as follows –

1. The extension of Aravallis is parallel to Arabian Sea branch of monsoon which escapes northwards without providing much rain in the state.

2. Moisture is considerably reduced in Bay of Bengal branch of monsoon by the time it reaches in Rajasthan.

3. Low height and lack of vegetation on Aravallis are also responsible for low rainfall in the state. The southern part of the state receives more than 100 cms. rainfall due to higher elevation and dense vegetative cover.

C. Autumn Season – Monsoon winds begin to retreat because lower pressure over land fades out and due to rise in temperature in Indian Ocean, low pressure develops there. Due to high temperature and high humidity in September and October sultriness prevails. The maximum and minimum temperature by the end of October remains at 35° C and 20° C respectively. This is the period of retreating monsoon. The winds are calm, very light and very unstable during this period.

- October heat – Increase in temperature during gap of monsoon.

D. Winter Season - The commencement of actual winter season in the state occurs in December because sun shines vertically over Tropic of Capricorn in the southern hemisphere. North-westerly cold winds begin to blow in the state. Light rainfall occurs twice or thrice in the state by temperature cyclones coming from west in December-January and is known as **Mawat.**

The temperatures are less than 10° C in northern Rajasthan in January and it remains around 20° C in Hadauti area. The average temperatures in the remaining Rajasthan ranges between 10° to 20° C. The state comes in the grip of cold wave, and temperature falls below freezing point at many places due to snowfall in Himalayan region

- **Mawath** - Rainfall in the winter season in Rajasthan is known as Mawath. The cyclones arising from the Mediterranean Sea bring rainfall in the North-West India including Rajasthan. This rainfall is a boon to rabi crop. It is good for the wheat crops, hence it is also known as “Golden Drops”

- Cold Winds comes from Himalayan region in January month whose direction is from North-East to South-West maximum benefitted to Churu district.