
Chapter-4

Climate



Difference between Climate and Weather :

- ❖ Weather is the mix of events that happen each day in our atmosphere
- ❖ Whereas weather refers to short term changes in atmosphere, climate describes what the weather is like over a long period of time in a specific area.
- ❖ The elements are same for weather and climate i.e temperature, wind, direction, atmospheric pressure, humidity and precipitation.
- ❖ The climate in India is monsoon type. This type of climate is found mainly in the south and southeast part of an Asia.
- ❖ Two important elements: Temperature and Precipitation . It is vary from place to place and time to time. Eg: Kashmir and Rajasthan

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- ❖ In summer, some parts of Rajasthan reaches 50 and in Jammu Kashmir 20 degree C but in winter season, Jammu Kashmir reaches minus 45 degree in Trivandrum temperature is 22 degree c
 - ❖ The precipitation is mostly in the form of snowfall in the upper parts of Himalayas, it rains over the rest of the country.
 - ❖ The annual precipitation varies from over 400 cm in Meghalaya to less than 10 cm in Ladakh and western Rajasthan.
 - ❖ Most parts of the country receive rainfall from June to September. But in Tamil Nadu coast gets large portion of its rain during October and November.



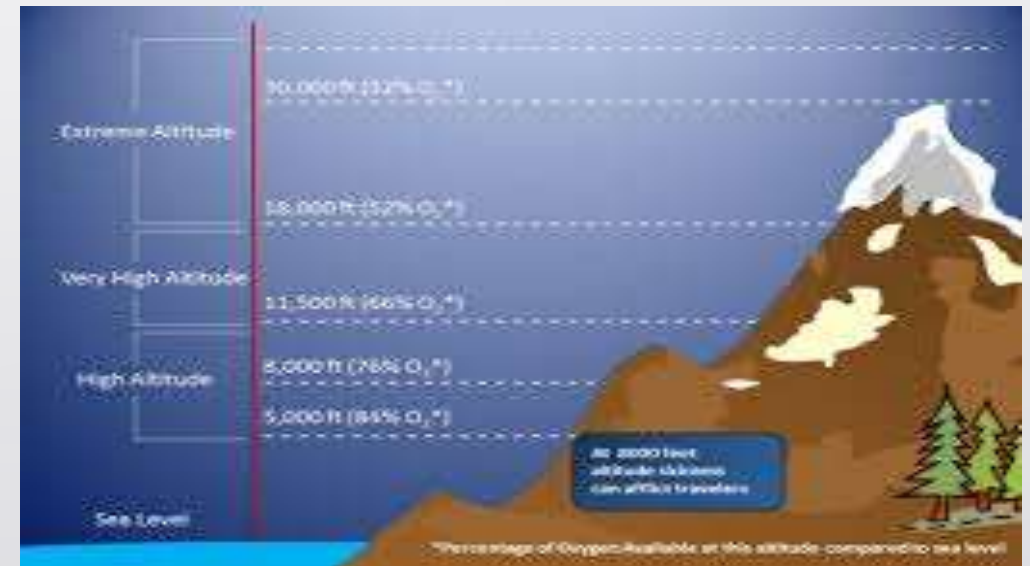
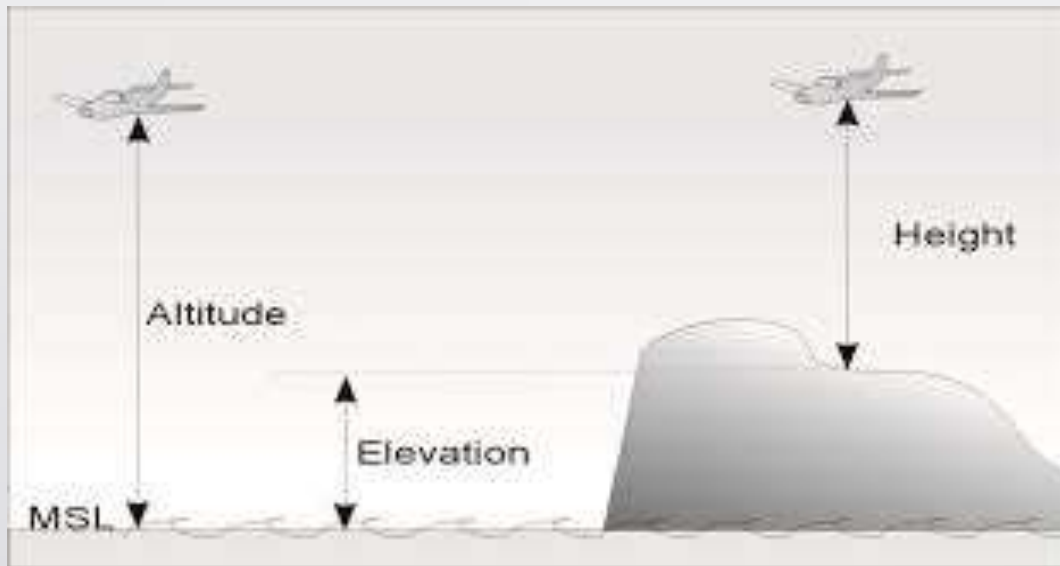
Climatic Controls

- ❖ Six major controls of the climate of any place: latitude, altitude, pressure and wind system, distance from the sea, ocean currents and relief features.
- ❖ Latitude: due to curvature of the earth the amount of solar energy received varies ,so that temperature in air decreases from the equator towards the poles.
- ❖ The tropic of cancer passes through the middle of the country from the Rann of Kuchchh in the west to Mizoram in the east.
- ❖ Almost half of the country lying south of the tropic and remaining lying in sub tropic.
- ❖ India's climate has characteristics of tropical as well as subtropical climates.



Altitude:

- ❖ As one goes from the surface of the earth to higher altitudes.
- ❖ The atmosphere becomes less dense and temperature decreases, therefore hills are cooler during summer.
- ❖ India has mountains to the north which have average height of about 6000 meters and has vast coastal area where the maximum elevation is about 30 meters.
- ❖ Himalaya prevent the cold winds from Central Asia.



Pressure and Winds:

- ❖ It depends on the latitude and altitude of the place. The sea exerts a moderating influence on climate.
- ❖ The climate and weather conditions in India are governed by the following conditions:
 - ❖ Pressure and surface winds
 - ❖ Upper air circulation and western cyclonic disturbances and tropical cyclones.
 - ❖ The pressure and wind conditions over India are unique. During winter there is a high pressure area north of the Himalayas.
 - ❖ In summer, a low pressure area develops over interior Asia as well as over northwestern India.
 - ❖ The upper air circulation in this region is dominated by a westerly flow. Important component of this flow is Jet Stream
 - ❖ These Jet Streams blow south of the Himalayas all through the year except in summer.

India Monsoon:

- ❖ The monsoons are experienced in the tropical area between 20°N and 20°S. To understand the mechanism following facts are important.
- ❖ The differential heating and cooling of land and water creates low pressure on the landmass of India while the seas around experience comparatively high pressure.
- ❖ The shift of the position of the Inter-tropical convergence zone in summer, over the Ganga plain.
- ❖ The presence of the high pressure area, east of Madagascar. The intensity and position of this high pressure area affects the Indian Monsoon.
- ❖ The Tibetan plateau gets intensely heated during summer, which results in strong vertical air currents and the formation of low pressure over the plateau at about 9 km above sea level.
- ❖ The movement of the westerly jet stream to the Himalayas and the presence of the tropical easterly jet stream over the Indian peninsula during summer.

The onset of the monsoon and withdrawal:

- ❖ The duration of the monsoon is between 100-120 days from June to mid September.
- ❖ Around the time of arrival the normal rainfall increases suddenly and continues constantly for several days. This is known as the 'burst' of the monsoon.

The Seasons:

The monsoon type of climate is characterized by a distinct seasonal pattern. The weather conditions greatly change from one season to other. There are four main seasons in India:

- ❖ **Winter (The Cold weather season):** it begins from mid November to February in north. December and January are coldest month in the northern part of India. frost is common in the north and the higher slopes of the Himalayas experience snowfall.
- ❖ **Summer (The hot weather Season):** due to apparent northward movement of the sun, the global heat belt shifts northwards. As such from march to may it is hot weather season. Rising temperature and falling air pressure in the northern part of the country.



The Rainy Season (Advancing Monsoon):

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- ❖ The inflow of the south west monsoon into India brings about a total change in the weather
 - ❖ The windward side of the Western Ghats receives heavy rain fall more than 250 cm.
 - ❖ Mawsynram receives highest average rainfall in the world. Rajasthan and Gujarat get scanty rainfall

Retreating / Post Monsoons:

- ❖ During October-November with apparent movement of the sun towards the south, the monsoon trough over the northern plains becomes weaker.

Distribution of Rainfall:

- ❖ Western coast and northeastern India receive over about 400 cm of rainfall annually.
- ❖ The annual rainfall is highly variable from year to year.