Class 9

Geography

Ch 4 Climate

READING MATERIAL

General weather conditions over a period of thirty years period is said to be the climate of a place.

Weather refers to the state of the atmosphere over an area at any point of time.

Temperature, atmospheric pressure, wind, humidity, and precipitation are elements of weather and climate.

Generalised monthly atmospheric conditions determine the basis on which the year is divided into the seasons — summer, winter or rainy.

India has a monsoon type of climate.

Monsoon is basically a seasonal reversal in the wind through the year.

There is huge difference in temperature from one region to another.

Form of precipitation, its amount and distribution also differ from one part of India to another.

Coastal areas observe lesser difference in temperature conditions. It is the interior of India that experiences temperature contrasts.

Decrease in rainfall is seen from east to west in the Northern Plains. All this influences diversity in professions, food, dress and houses of people.

Climatic Controls

The interplay of latitude, altitude, distance from the sea, pressure and wind system, ocean currents and relief features determine climatic conditions of a place.

Factors Affecting India's Climate

Latitude, altitude and pressure and winds affect Indian climate.

The Tropic of Cancer passes through the middle of the country from the Rann of Kuchchh to Mizoram.

Air temperature generally decreases from equator to poles.

Temperature and air pressure decreases as on moves from surface of the earth to higher altitudes.

The Himalayas prevent the cold winds from central Asia from entering the subcontinent.

The climate and associated weather conditions in India are governed by various atmospheric conditions namely pressure and surface winds, upper air circulation, western cyclonic disturbances and tropical cyclones.

The sea exerts a moderating influence on climate. People far away from sea experience extreme weather conditions. This is known as ‘continentality’.

Ocean currents also affect the climate of the coastal areas.

An apparent force caused by the earth’s rotation is the Coriolis Force.

The wind direction changes as per the season. They are from northeast to south wet in winter whereas completely reverse in summer bringing moisture.

Jet streams are narrow belts of high-altitude (above 12,000 m) westerly winds in the troposphere.

The western cyclonic disturbances are weather phenomena of the winter months, brought in by the westerly flow from the Mediterranean region.

The Indian Monsoon

The climate of India is strongly influenced by monsoon winds.

The Arab traders who noticed these winds named it as monsoon.

Following facts are important to understand mechanism monsoons –

The differential heating and cooling of land and water.

The Inter-Tropical Convergence Zone (ITCZ) is a broad trough of low pressure in equatorial latitudes where the northeast and the southeast trade winds converge.

The presence of the high-pressure area, east of Madagascar.

The intense heating of Tibetan plateau during summer.

The movement of the westerly jet stream to the north of the Himalayas and the presence of the tropical easterly jet stream over the Indian peninsula during summer.

Apart from his changes in the pressure conditions over the southern oceans also affect monsoon.

The periodic change in pressure conditions known as ‘Southern Oscillation’ or SO affects monsoon too.

El Nino is a warm ocean current that flows past the Peruvian coast in place of the cold Peruvian current, every 2 to 5 years.

The Onset of the Monsoon and Withdrawal

The monsoon are pulsating winds affected by different atmospheric conditions encountered by it, on its way over the warm tropical seas.

Monsoon arrives at the southern tip of the Indian peninsula generally by first week of June.

Sudden increase and continuation of the monsoon for several days is called as ‘burst’.

The Arabian Sea and the Bay of Bengal branches of the monsoon merge over the northwestern part of the Ganga plains.

The withdrawal or the retreat of the monsoon is a more gradual process which begins in the northwestern states of India by early September.

The retreating monsoon or the transition season sees the change from hot rainy season to dry winter conditions.

The low-pressure conditions over northwestern India get transferred to the Bay of Bengal by early November causing cyclonic depressions originating over the Andaman Sea.

Distribution of Rainfall

Owing to the nature of monsoons, the annual rainfall is highly variable from year to year.

Areas of high rainfall are liable to be affected by floods while areas of low rainfall are drought prone.

The Seasons

Four main seasons can be identified in India — the cold weather season, the hot weather season, the advancing monsoon and the retreating monsoon with some regional variations.

In the cold weather season the northeast trade winds prevail over India.

Days are warm and nights are cold.

Frost is common in the north and the higher slopes of the Himalayas experience snowfall.

The summer months experience rising temperature and falling air pressure in the northern parts of the country.

A striking feature of the hot weather season are strong, gusty, hot, dry winds blowing during the day over the north and northwestern India called loo.

In the advancing monsoon, i.e. the rainy season, the north-western region of the country receives the maximum rainfall.

The dust storms in northern India are common.

The localised thunderstorms, associated with violent winds, torrential downpours, often accompanied by hail. In west Bengal they are known as ‘Kaal Baisakhi’.

From June onwards the monsoon occupies most of the Indian Peninsula and central part within a month.

Monsoon has ‘breaks’ in rainfall, thus it has wet and dry spells.

The alternation of dry and wet spells vary in intensity, frequency and duration causing heavy floods in one part and droughts in the others.

By the beginning of October the monsoon withdraws from Northern plains.

The conditions of high temperature and humidity, the weather becomes rather oppressive during the day and is called as October heat.

Rainfall in India ranges from 400 cm in western coast and northeastern India to 60 cm in Western Rajasthan and adjoining area.

Monsoon as a Unifying Bond

The dependence of farmers on rain, a change in seasonal cycle, variance in temperature, the needs of humans, plants and animals, festival dates etc., all depend on monsoon in India. In this way monsoon is a unifying bond for Indians.