Climatic Controls

Permanent factors which govern the general nature of the climate of any location on the earth are called factors of Climatic Controls.

The factors of climatic controls are

- **Latitude** The angular distance of a location from the equator in North-South direction is called latitude. Due to curvature of the Earth, the amount of solar energy received varies with latitude. As a result, air temperature decreases from the equator towards the poles.
- **Altitude** It refers to the height above mean sea level. With increase of height from the Earth surface, the temperature decreases and air becomes less dense. Therefore, hilly regions are cooler in summer.
- **Pressure and Wind System** It depends on the latitude and altitude of a place. It influences the temperature and rainfall pattern of the area.
- **Continentality or Distance from the Sea** The sea exerts a moderating influence on the climate. As the distance from the sea increases, the weather conditions become more extreme. This condition is known as continentality. i.e. high temperature and rainfall variation between seasons.
- **Ocean Currents** Alongwith onshore winds, the ocean currents (warm or cold) affect the climate of coastal areas. For example, cold onshore currents bring coolness in coastal areas.
- **Relief Features** High mountains stop cold or hot winds from reaching a location. It can also cause rain or snow if the place is on the windward side of the mountains. The leeward side of mountains is relatively dry.

Factors Affecting India's Climate

Latitude

The Tropic of Cancer (23°30′ N) divides the country into the tropical zone (South of this line) and the sub-tropical zone (North of this line). The line runs from the Rann of Kachchh (West) to Mizoram (East). So, India's climate has characteristics of tropical as well as sub-tropical climates.

Altitude

Mountains in the North of India have an average elevation of about 6000 m, whereas on the coastal areas as well as islands, maximum elevation is about 30 m.

The Indian sub-continent experiences milder winters as compared to Central Asia because of the Himalayas which prevent the cold winds from entering the sub-continent.

Pressure and Winds

The following atmospheric conditions govern the climate and associated weather conditions in India

(i) Pressure and surface winds

(ii) Upper air circulation

(iii) Western cyclonic disturbances and tropical cyclones

(i) Pressure and Surface Winds

India lies in the region of North-Easterly surface winds. These winds originate and blow over land during winter from the sub-tropical high-pressure belt of the Northern hemisphere. These winds blow South, get deflected to the right due to the **Corliosis force** and move towards the equatorial-low pressure region.

They carry very little moisture, therefore, they bring no rain or very little rain. During winter, high-pressure areas develop over the areas North of Himalayas. This causes cold dry winds blow from the area towards low-pressure area over the oceans to the South.

In summer, due to high temperature, low-pressure area develops over interior Asia and over North-Western India. Air from high-pressure areas of Southern Indian Ocean blow and crosses the equator and turns right towards this low pressure region resulting in complete reversal of wind direction.

These winds gather large moisture and bring widespread rainfall over the mainland of India. These winds are known as the **South-West Monsoon winds.**