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Geography Class

Date
25/08/2020

Topic

Precipitation, Climatic Zones

Monsoon is a secondary category of air circulation characterised by seasonal reversal in their direction. The term monsoon is derived from a Arabian word ~~mos~~ "MAUSIN" which literally mean season however under meteorological illustration monsoon is derived as a thermodynamic modification of HADLEY CELL. This modification of HADLEY CELL depends on several climatological, geomorphological and oceanographic factors like solar insolation and insolational heating, temperature and pressure gradient, upper atmospheric circulation (Jet stream), Relief and landform, vegetation and soil and oceanic currents. It should be noted that the intensity of monsoon circulation remain very high over Indian subcontinent where some distinctive feature of monsoon can be easily identified.

- ① South West Monsoon (J-Sep)
- ② Retreating Monsoon (Sep-Dec)
- ③ North East Monsoon (Dec-Feb)
- ④ Pre Monsoon (Feb-Jun)
Showers.

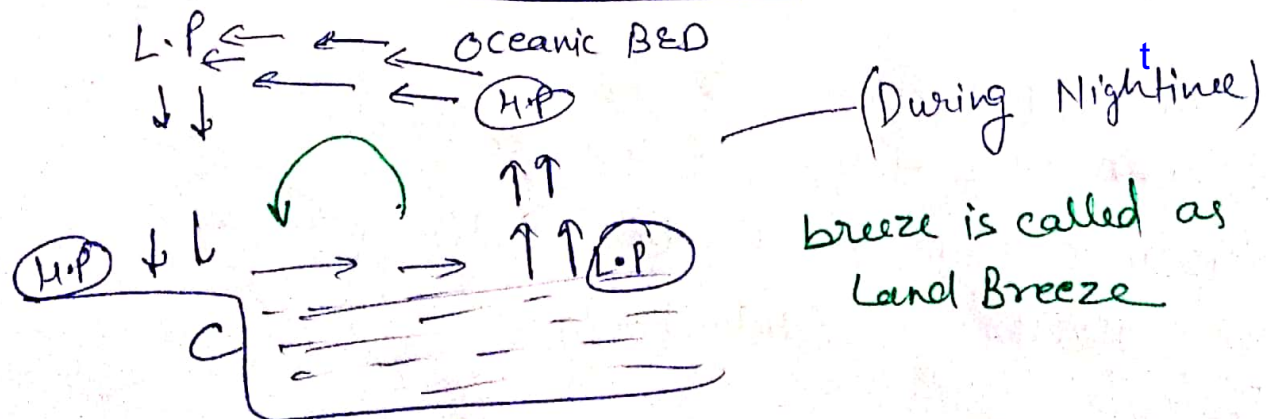
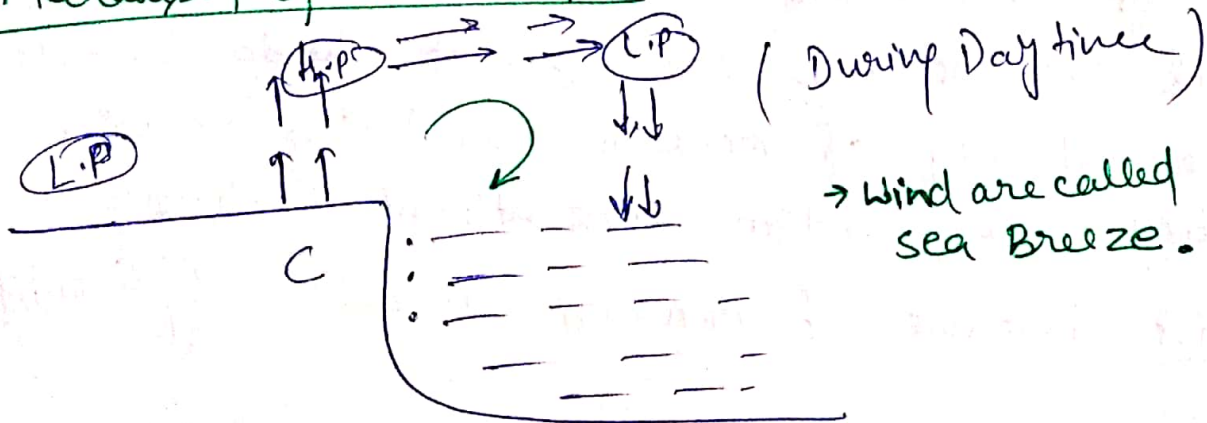
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Features of Monsoon in India

- Seasonal reversal upto 180° could take place in the direction of these winds.
- In the months of July and August acceleration could reach upto 3 meter per second square. (3 m/s^2)
- Based on monsoon circulation the whole climatology of Indian Subcontinent can be categorised into 4 specific monsoon seasons.

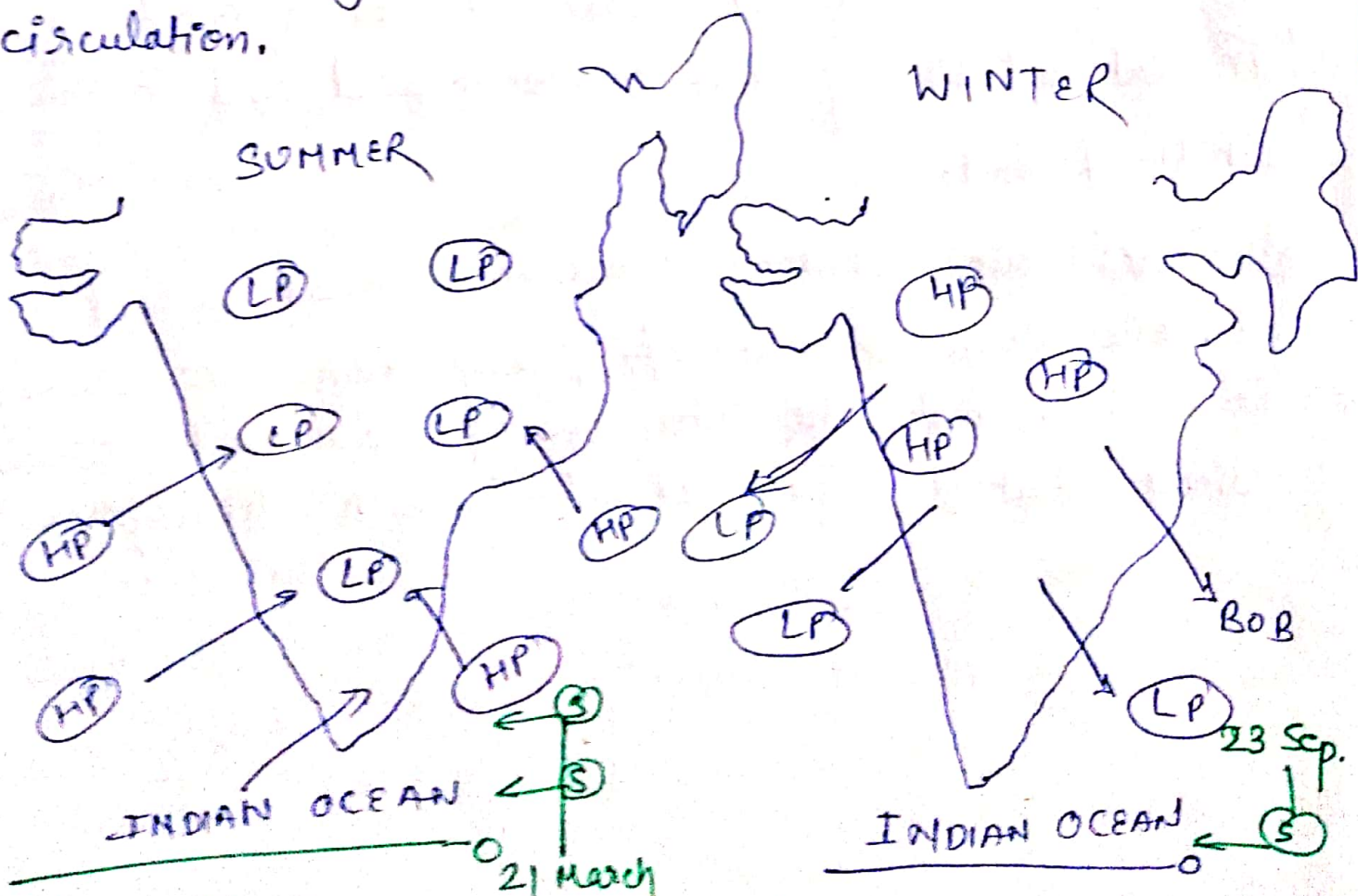
- South West Monsoon (from June to September)
- Retreating Monsoon (from Sep to Dec.)
- North-East Monsoon (from Dec to Feb)
- Pre Monsoon Showers (from Feb to June)

Mechanism of Monsoon



Thermal Theory

It was proposed by Halley in 1687 based on the perception that monsoon winds are nothing but the replication of land breeze and sea breeze, the Northward and Southward shift of Sun creates differentiated thermal condition and pressure systems over continental landmass of India and adjoining water bodies. In this change atmospheric scenario winds start propagating from sea to land during summer and land to sea with the arrival of winters. Halley regarded these winds as monsoon circulation.



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Dynamic Theory of Monsoon

Dynamic Theory was proposed by Scholar Fohn in 1951. The Dynamic nature of monsoon depends on the northwards and southwards of sun.

It was proposed by Fohn in 1951, by taking the attributes from the earlier theory of Halley. This theory was based on two specific climatological assumptions.

1. Pressure Belts are not static but dynamic in their implications / character. The dynamic nature of pressure belts (shifting of pressure belts) depends completely on solar insolation and insolational heating that is Northward and Southward Shift of Sun.

2. The main monsoon circulation that called tremendous amount of precipitation over India is nothing but the extension of South East Trade winds that is Easterlies of Southern Hemisphere.

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According to this theory after march with the northwards shift of SUN. When the solar insolation remain vertical in Northern Hemisphere, sequential shifting of ITCZ. also takes place towards north. In the course of time this low pressure belt of ITCZ, reaches upto 25° Northern latitude i.e; subtropical region of Indian subcontinent including Punjab, Haryana, Rajasthan, western U.P and the whole Gangetic plain. By this subsequential phenomena of Dynamic Pressure belt and intense low pressure condition develop over Subtropical India to attract winds from different directions. In this change atmospheric scenario the prevailing south-east trade winds in search of low pressure vacuum cross equator deflects to its right hand side and transform into south-west monsoon.

After September with the southwards of shift of SUN when all the pressure belt shifting towards south the revocation of ITCZ also takes place back towards equator by this resultant phenomena during winter, low pressure condition elements from subtropical latitudes and a prominent high pressure condition system develop over 25° Northern latitude.

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In this change atmospheric ~~scenario~~ winds start propagating from subtropical India towards water bodies like Arabian Sea and Indian Ocean and Bay of Bengal such propagating air motion now get the designation of Retreating monsoon.

The branches of retreating monsoon propagating over the surface of Bay of Bengal in North-East South west direction, to cause sufficient precipitation over Coromondal Coast are regarded as North-east monsoon winds.