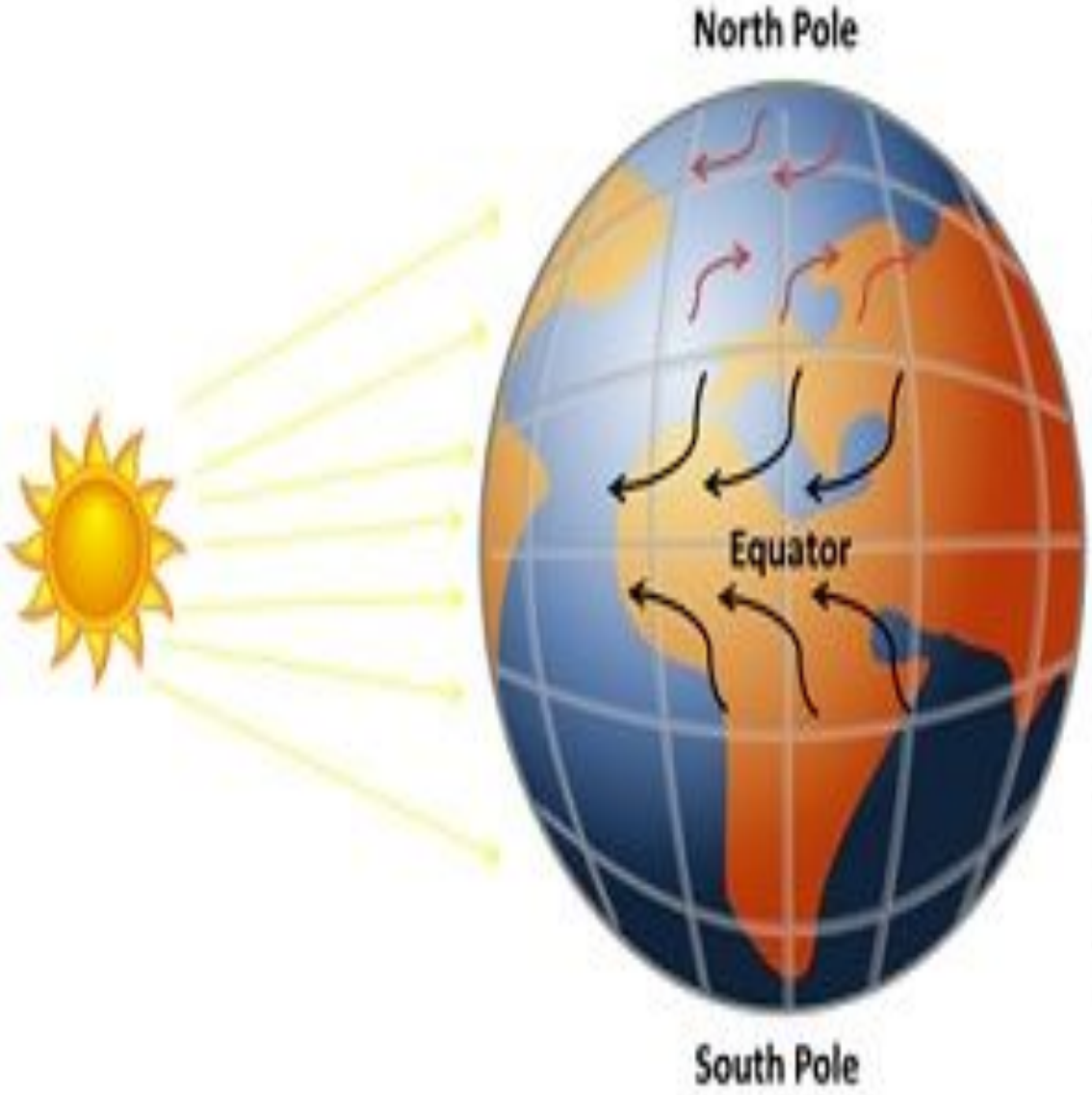
Causes of Wind Generation -

Winds or wind currents are generated by two factors:

1. **Uneven heating between Poles and Equator**
   - **Centre of the earth is called Equator and the two extreme positions are Poles.**
   - **Poles are cooler than equator as highest intensity of the sun's heat and light falls on the equator and it reduces as we go either side of equator towards the poles.**

- **Cooler air from surrounding areas of the equator comes towards the equator to fill the place of warm air which rises up due to sun's heating.**
- **Similarly, cooler air from poles comes towards the surrounding areas as the surrounding areas have air warmer than the poles.**
- **These winds from north to equator and south to equator are not straight as their direction change due to earth's rotation on its axis.**

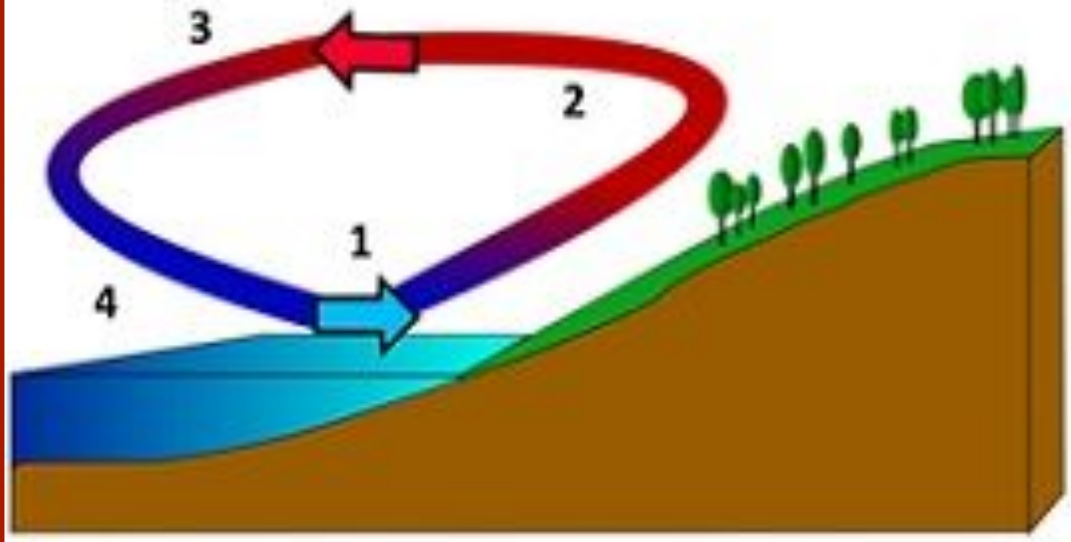


Black Arrow denotes the cooler air coming from 30° Latitude towards equator.

Red Arrow denotes the cooler air coming from poles towards 60° Latitude. Also, warmer air from 60° rising up.

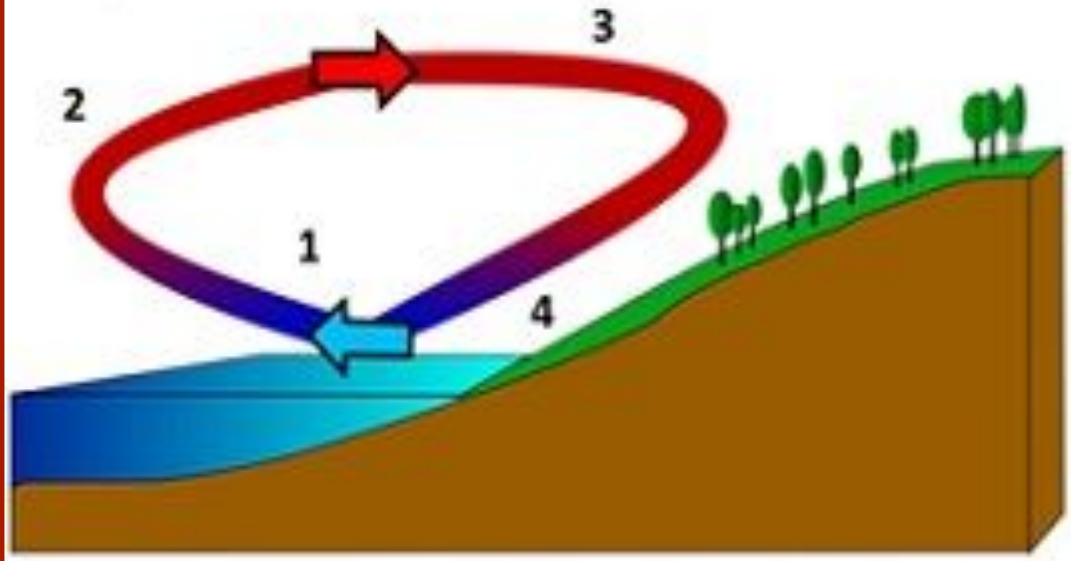
Uneven heating between Land and Water -

- This occurs in the coastal areas.
- Sea Breeze: This causes the wind to move from Sea towards Land and the process continues during the day. These are also called Monsoon winds.
- Land Breeze:This causes the wind to move from Land towards Sea and the process continues during the night.



Sea Breeze (Day Time)

1. Cool air moves from Sea to Land.
2. Warm air from land rises up.
3. Warm air takes place of cool air at high atmosphere.
4. Cool air is pushed down towards sea.

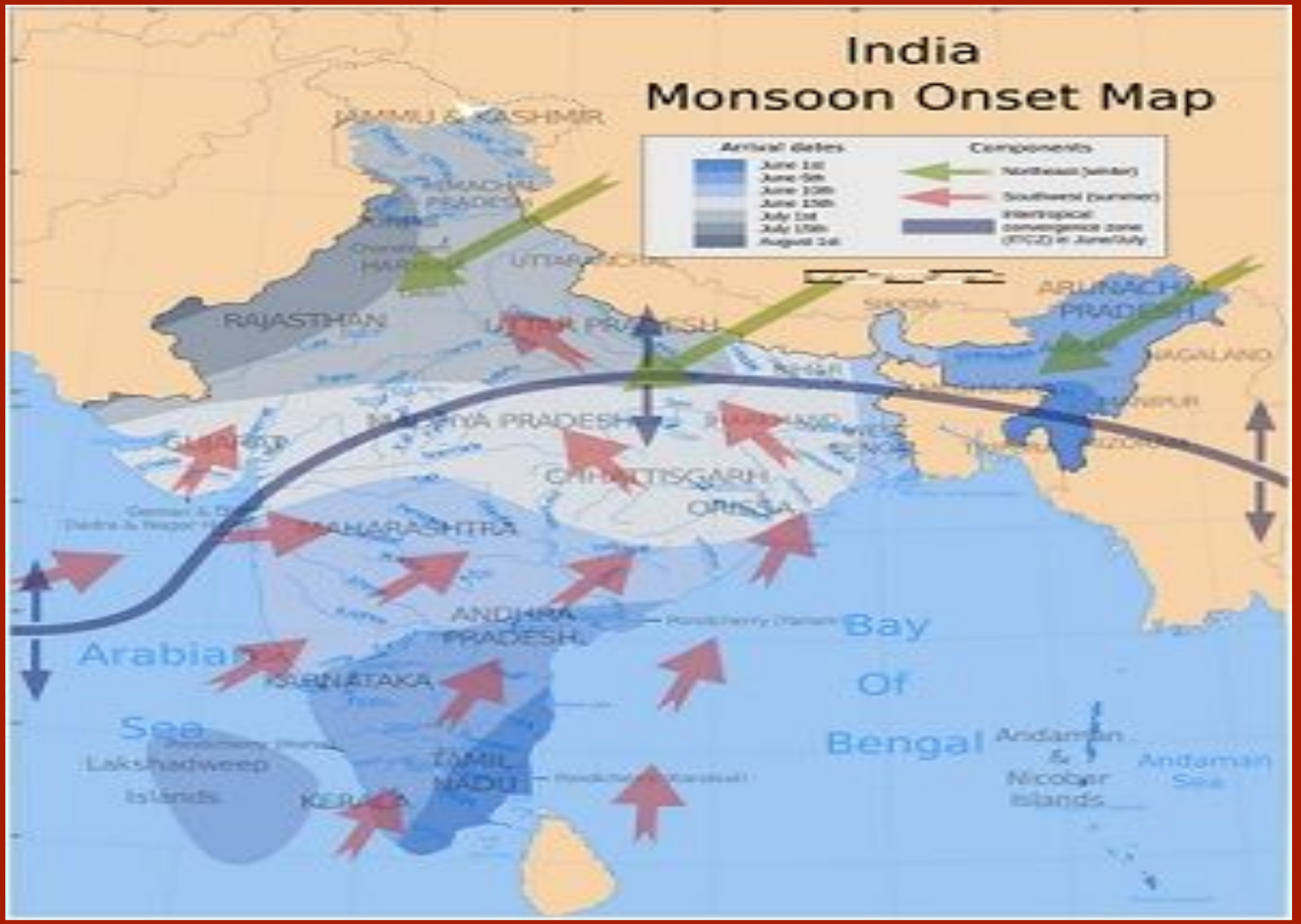


Land Breeze (Night Time)

1. Cool air moves from Land to Sea.
2. Warm air from sea rises up.
3. Warm air takes place of cool air at high atmosphere.
4. Cool air is pushed down towards land.

Summer and Winter Winds -

- During summer season, winds blow from sea towards land on a large scale.
- These winds carry water droplets with them and form clouds.
- During monsoon season, these clouds rain as they become heavier.
- Rain is useful for farmers for irrigation but excessive rain causes floods and diseases.
- During winter season, the winds blow from land to sea and they do not carry any water droplets with them. Hence, Monsoon season occurs only after summer season.


India
Monsoon Onset Map
Arrival dates
June 1st
June 5th
June 10th
June 15th
July 1st
July 15th
August 1st
Components
Northeast (winter)
Southwest (summer)
Intertropical convergence zone (ITCZ) in June/July
JAMMU & KASHMIR
RAJASTHAN
ARUNACHAL PRADESH
MAHARASHTRA
ANDHRA PRADESH
KARNATAKA
TAMIL NADU
Arabian Sea
Bay Of Bengal
Lakshadweep Islands
Andaman & Nicobar Islands
Andaman Sea

PLENARY -

Q. Due to uneven heating of land and ocean water what happens in the following season?

(a) In winter season

(b) In summer season

A. Due to uneven heating of land and ocean water.

(a) In winter season The uneven heating of land and water generates winds from the North-West colder land which carry little water. It brings small amount of rain in winter season.

(b) In summer season The uneven heating of land and ocean water generates wind from the South-West direction. These winds carry lot of water from the Indian ocean.

Q. How are the pressure difference created in nature?

A. Pressure difference is created in the nature by the heat of the sun. When it falls on the earth surface, the surface of the earth gets heated and air above it also gets warm and becomes light weight and moves upward. Thus, the pressure difference is created.

Q. A flat in Mumbai with a balcony facing the sea has some clothes hung on a clothesline in the balcony. Towards which direction, the clothes will be blown in the afternoon? Explain it.

A. As during the afternoon, the land becomes hot which ultimately creates hot air above it and we know that hot air rises up and there is low pressure created. Thus, winds from sea start blowing towards the land and the clothes will be blown towards the house because sea breeze blowing towards the land.

ASSESSMENT / EVALUATION -

Q. Monsoon brings rain. Explain the formation of monsoon.

A. During summer, when the land gets warmed and temperature of land becomes higher than that of water in ocean. The air above the land gets heated and rises. Therefore, the cold wind flows from the ocean towards the land. These are monsoon winds which bring water and cause rain.

Q. Describe the following terms briefly.

(a) Trade winds

(b) Westerlies

(c) Polar winds

A. (a) The permanent wind that blows towards the equator from North to South are called trade winds.

(b) The wind blowing towards 60°N and 60° S latitudes are called westerlies.

(c) The set of wind blowing from the cold polar regions towards 60° N and 60° S latitudes are called polar winds.

Q. The picture in figure shows tree line along the sea coast on an tops are permanently bent in one direction. Are the trees bend island near the equator. As shown, the tree towards the sea or away from it? Explain.

A. In the given figure, the tree line along the sea coast on an island near the equator shows that tree tops are permanently bent in one direction. The reason behind this movement of tree is that during the day time the wind blows from sea to land because land gets warmer more quickly than sea.

This makes the air of land, warm and lighter which is raised up in the sky. Therefore, the top of the bent trees shows the moving direction of wind from sea to land.