

What is condensation? what are its different types?

The process by which water vapour changes into water droplets is called condensation.

The different types of condensation are

1) **Cloud** - Moist and warm air is light. It rises and becomes cooled at higher altitude. So condensation takes turns water vapour into tiny droplets or ice particles which float in air. This floating particles are together called cloud.

2) **Dew** - is formed when Earth's surface or lower atmosphere becomes too cold to cause the water vapour in the air to condense into water drops. These are seen on grasses or belts during winter. This is dew.

3) **Fog** - It is a cloud of water droplets suspended in air of lower level of atmosphere near the ground. Dense fog in winter mornings affect human activities, transport, shipping etc.

4) **Smog** - Smog is a kind of air pollution originally named for the mixture of smoke and fog in the air. It is usually caused by the burning of large amt of coal or by vehicular emissions.

Classify clouds according to shape

According to shape clouds are of two types

Stratus - The clouds which form layers are called stratus.

Cirrus - The clouds which form cotton shaped formation in sky is called cumulus.

What are the different types of rainfall. Describe the mechanism of each type.

Convectional Rainfall - It occurs in the regions where two main conditions prevail.

(a) The vertical rays of the sun which cause immense heating of the Earth's surface and surrounding air.

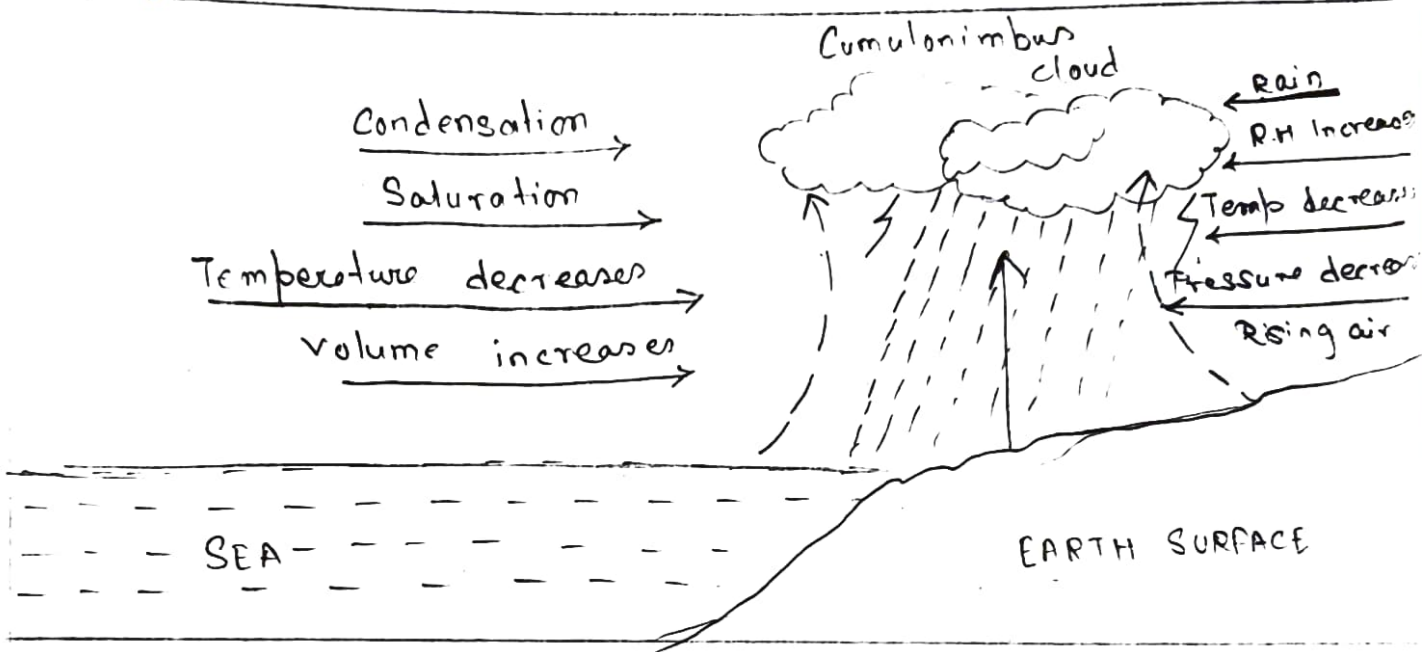
(b) Presence of vast waterbodies which produce plenty amt of moisture and added in the air. Hot and moist air move upward direction as it becomes lighter. After reaching certain altitude the air saturates and starts condensing. Thus the clouds are formed immediately. Thus in the process of convection cycle the air gets heated and condensed. Finally heavy rainfall occurs.

Ex - In equatorial region, convectional rainfall are common. Every afternoon, the rainfall occurs thus it is called 4 o'clock rainfall.

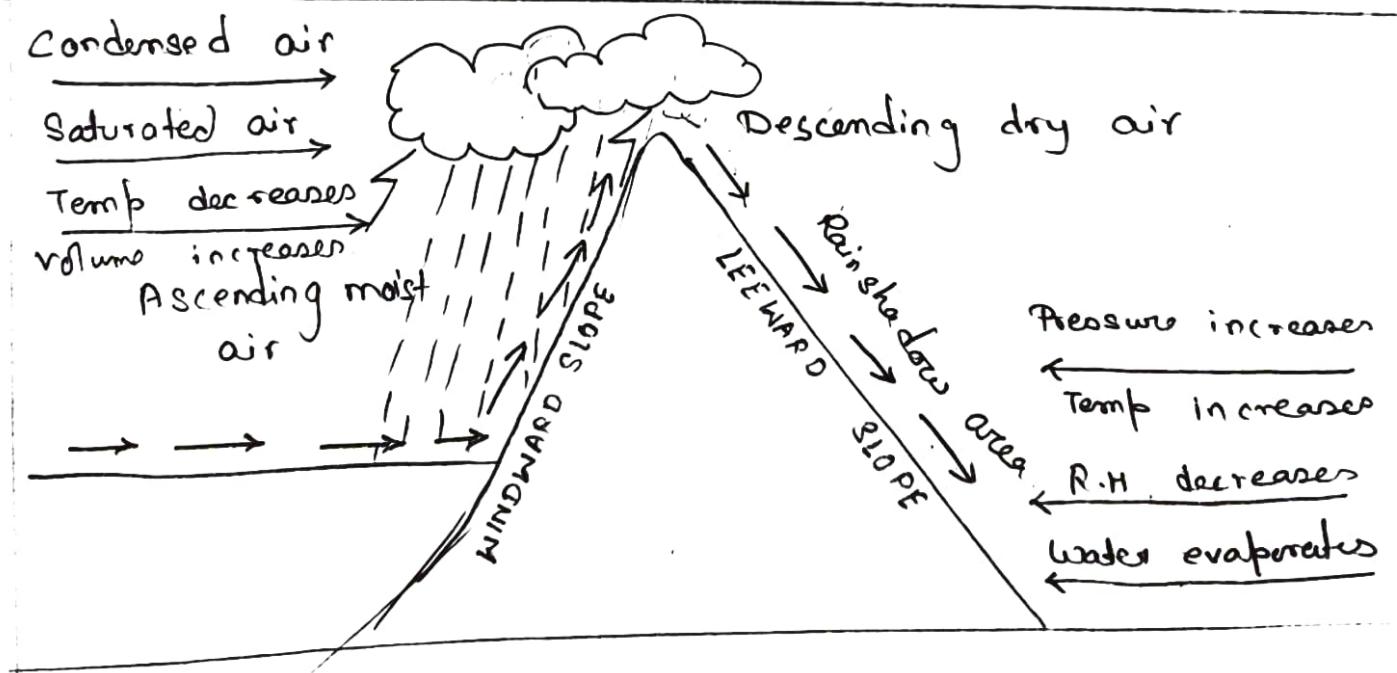
Orographic Rainfall - The word orographic signifies that the influence of mountain. These types of rainfall is greatly influenced by the relief of the region on the mt of that region.

The moist air moves ~~down~~ along the slope of mountain and at certain altitude, it comes in contact with ~~water~~ cooler air. Thus the air condenses and cause the rainfall in the windward slope of mountain. But at the leeward slope, the air descends and does not cause any rain. Because already the air loses its moisture holding capacity increases. The air becomes unsaturated. Thus, the rainshadow region develops in the leeward slope of mt.

Ex - The S-W monsoon wind cause orographic rain in western part of Eastern Ghats and eastern slope of western Ghats or Deccan Plateau forms rain shadow region

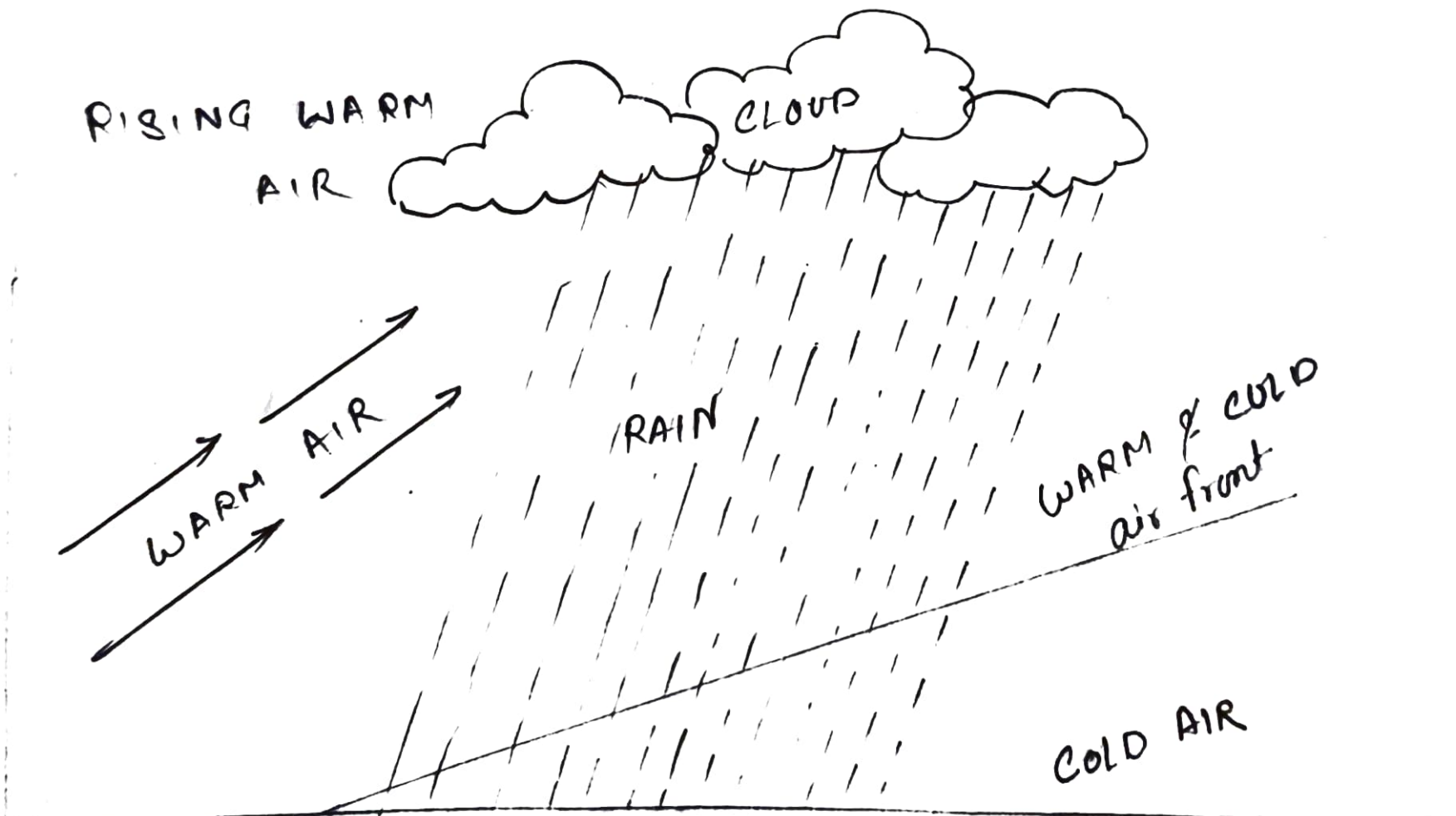


CONVECTIONAL RAINFALL



OROGRAPHIC RAINFALL

Cyclonic / Frontal Rainfall - Cyclonic rainfall is caused by the convergence of warm and cold air mass along a front. Thus it is also called frontal rainfall. It occurs in the temperate latitude. When the moisture laden warm air current and the cold air current approach each other from the opposite direction, the warm air climbs up. As the cold air is more dense and heavy, it pushes the warm air to move up. Along the line of convergence the cold air moves horizontally while the warm air ascends it comes in contact with cooler air and get condensed. Thus the clouds form and rainfall starts. Ex - It occurs mainly in temperate latitudes in European countries.



RISING WARM
AIR

CLOUD

WARM AIR

RAIN

WARM & COLD
air front

COLD AIR

CYCLONIC RAINFALL

Define climatic region. Name the major climatic zones of the world.

A climatic region is an area on the Earth's surface throughout which there are similarities in conditions of relief, climate, natural vegetation, flora, fauna and human activities.

Major climatic regions are

- (a) Equatorial hot & humid climate
- (b) Tropical monsoon climate
- (c) " desert "
- (d) Mediterranean "
- (e) warm temperate grassland climate or step climate
- (f) Cool temperate or Taiga climate
- (g) Tundra climate

Describe the climate and vegetation characteristics of the following climate.

Equatorial hot and humid climate

It prevails in Amazon basin of South America, Congo Basin of Africa, Malaysia, Indonesia, Sri Lanka in Asia, New Guinea of Australia.

- 1) It is a hot and humid type and no changes of seasons occur. receives vertical sun rays.
- 2) Summer prevails throughout the year. Average temperature remain 38°C throughout the year.
- 3) There is very low annual range and diurnal range of temp.
- 4) There is no winter season.
- 5) Heavy rainfall is experienced throughout the year. Annual rainfall is 200-250 cm.

Vegetation

The forest of Amazon basin is called Selva.

- a) Evergreen trees are found. Rosewood, sandalwood, Mahogany, Ebony, Ironwood.
- b) The trees are 40-50m tall with several branches and broad leaves.
- c) The Ironwood is used to make furniture.
- d) " trees make canopy layer. So sunlight can't penetrate the ground.
- e) Small bushes and under growth are common.
- f) The forest have dangerous reptiles and animals.
- g) The main occupations of people of this area are hunting and food gathering.
- h) Pygmy and Bantu are the inhabitants of this forest.
- i) In parts of Malaysia, rubber and cocoa cultivation has developed recently.
emergent lay - Rosewood, Canopy - Ebony, ironwood, sandalwood
creepers large undergrowth [Amazon forest Selva]

Tropical Monsoon type of climate

India, Bangladesh, Myanmar, ~~South China~~, Laos, Cambodia, Vietnam in Asia, Madagascar island in Africa, Mexico in North America, Northern Australia ^{near Gulf of Carpentaria} parts of Brazil, parts of Australia, ~~Madagascar Island~~, Thailand.

- 1) The most striking feature is ~~it hot and~~ cycle of seasons. It is hot and humid.
- 2) It receives hot summer. Avg temp 20°C .
- 3) It experiences mild winter ~~and~~ except mountainous region. Avg temp $10^{\circ}-15^{\circ}\text{C}$.
- 4) Heavy rainfall occurs.
- 5) S-W monsoon during summer and NE monsoon during winter.
- 6) Norwesterly cyclone affects the coast of Bay of Bengal.

Vegetations

The major vegetation is Deciduous. The species of trees are Sal, Teak, Mango, Banyan are Humid deciduous and dry deciduous. species are Mahua, Palash.

- 1) They have tall and broad leaves.
- 2) They are hard wood.
- 3) Hard woods are used for making furnitures; sheds leaves in dry season.

Human activities

- 1) The region is well developed in agricultural and industrial sector. Major industries are iron and steel, cotton textile, sugar mill etc.

Tropical Hot Desert Climate

Thar desert is India & Pakistan, Atacama in S America Sahara in Africa and Arabian desert in Saudi Arabia.

- 1) Extreme type of climate prevails.
- 2) There is high diurnal and annual range of temperature.
- 3) Summer temp is $40^{\circ}-45^{\circ}$ and winter $2^{\circ}-9^{\circ}$ C.
- 4) Rainfall is very scanty 20-25 cm.
- 5) Sandstorms are found.

Natural Vegetation

Cactus, Thorny bushes, Acacias, Date and Palm.

Occupation of people

People are nomads, Beduins are the inhabitants in Arab. Main occupation is food gathering and animal rearing.

Mediterranean Region

Southern part of Europe, coastal region of Europe in Spain, Italy, France, Jordan etc. California coast of USA, Algeria in Africa, Central Chile in Asia, Murray-Darling basin in Australia.

- 1) This region has warm and dry summer and mild and moist winter.
- 2) Avg summer temp $30^{\circ}-35^{\circ}$ C
- 3) " winter " $10^{\circ}-15^{\circ}$ C
- 4) Rainfall occurs in winter. Summer is dry.
- 5) Annual avg rainfall 50-75 cm
- 6) Westerlies give rainfall during winter.

Warm temperate grassland type or step climate

In Eurasia it is called (steppe) in North America (prairies) and South America (Pampas) Africa (veld) and Australia (Downs)

1) It experiences warm summer and cool winter

2) Avg summer temp 25° - 30° C and winter

2° - 5° C

3) Moderate rainfall i.e. 20-50cm annual avg.

4) Due to scanty rainfall no big trees are found. Rather grasses are found.

5) Grasses are short and juicy and are ideal fodder crops e.g. - Alfa-Alfa - hay, clover.

Human Activities

Dairy industry, livestock farming and meat industries have developed. In parts of prairies and pampas agriculture is done by clearing forest.

Tundra Climate

Northern part of Asia, Europe, and North America.

1) Experiences short summer and prolonged winter (8-9 months)

2) Avg summer temp 0° - 10° C and winter temp -35° to -40° C. Coldest place is situated in Verkhyanas (-70° C) in Siberia.

3) Snowfall and drizzles are common.

4) Cold polar winds blow.

5) During winter no vegetation is found. Only during summer mosses and lichens are grown.

Human activities

Eskimos live in Greenland, Samoyeds live in Siberia, Lappe live in Norway, fins live in Finland.

Yakuts live in Siberia, Chukchi's live in Canada and parts of Alaska.

Food gathering and seal fish hunting is main occupation. The word eskimos means ~~eaters~~ eaters of raw flesh. During summer they live in tupics. In winter they live in igloos. They use boats called kayaks. They use sledge carried by Huskies.

Name the temperate grassland.
Patagonia in S America, Taklamakan, Mongolia and Gobi in Central Asia.

Temperature and Rainfall graph.

→ Bar graph represents rainfall and line graph represents temp.

If the line graph is convex shaped it indicates northern and if it is concave it indicates southern hemisphere.

Taiga Climate

It prevails in northern part of Russia, parts of Norway, Sweden, Finland, Canada, and Alaska.

- 1) The region experiences cool summer and cold winters.
- 2) The summer is short (3-4 months) and winter are prolonged and cold (7-8 months)
- 3) Avg summer temp $2-10^{\circ}\text{C}$ & winter temp -10 to $+5^{\circ}\text{C}$

Natural vegetation

These region have coniferous trees like pine, fir, spruce, birch, beech, alder.

- 1) Trees are tall with soft wood & bare branches
- 2) leaves are ~~needle~~ needle shaped.
- 3) Trees are cone shaped and leaves and branches are down sloping to avoid damage against snowfall.
- 4) The wood are useful for making newsprint, ply wood, match box matches and paper.