Precipitation Forms and Types

1. Precipitation

Precipitation is the general name given to all forms of moisture that falls from the atmosphere on to the ground. It includes rainfalls, snow, sleet, glaze and hail.

Rainfall is the amount of rain that falls in a location over a period and therefore a type of precipitation that occurs when water vapor in the atmosphere condenses into droplets that can no longer be suspended in the air.

Rainfall is formed when saturated air is heated (air that cools down at dew point) and rises either by a mountain, conventional currents or frontal action. The rising saturated air or water vapor cools down as it rises. It attaches itself to tiny particles of dust, salts, seeds or smoke in the atmosphere.

These particles are commonly called condensation nuclei. Condensation takes place when the water droplets join together on the condensation nuclei to form raindrops. Clouds are formed as the rain drops develop.

1.1. Types of Rainfall

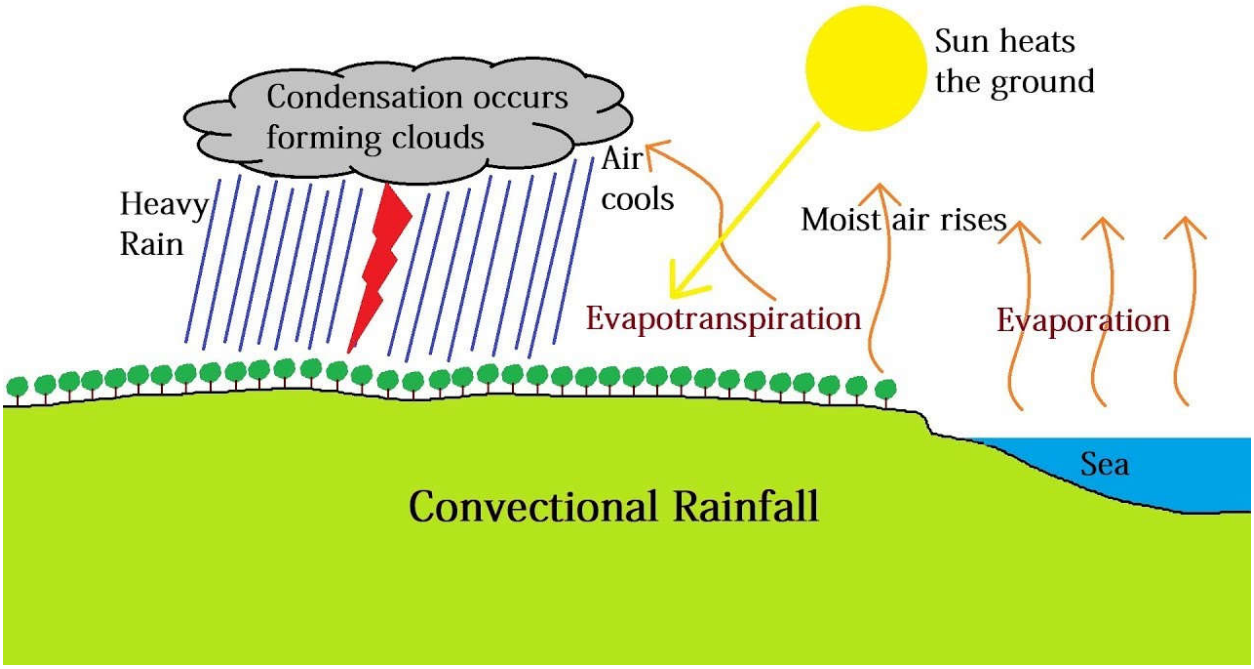
These are:

- Conventional Rainfall
- Orographic or Relief Rainfall and
- Frontal or Cyclonic Rainfall

1.1.1. Conventional Rainfall

Conventional rainfall is formed when air on the surface of the earth and few meters above it is heated by the sun. As the air is heated, it becomes lighter (water vapor). The lighter air rises, cools down, and then condenses on the condensation nuclei in the atmosphere. When water vapor rises further, it converges and moves gradual upwards.

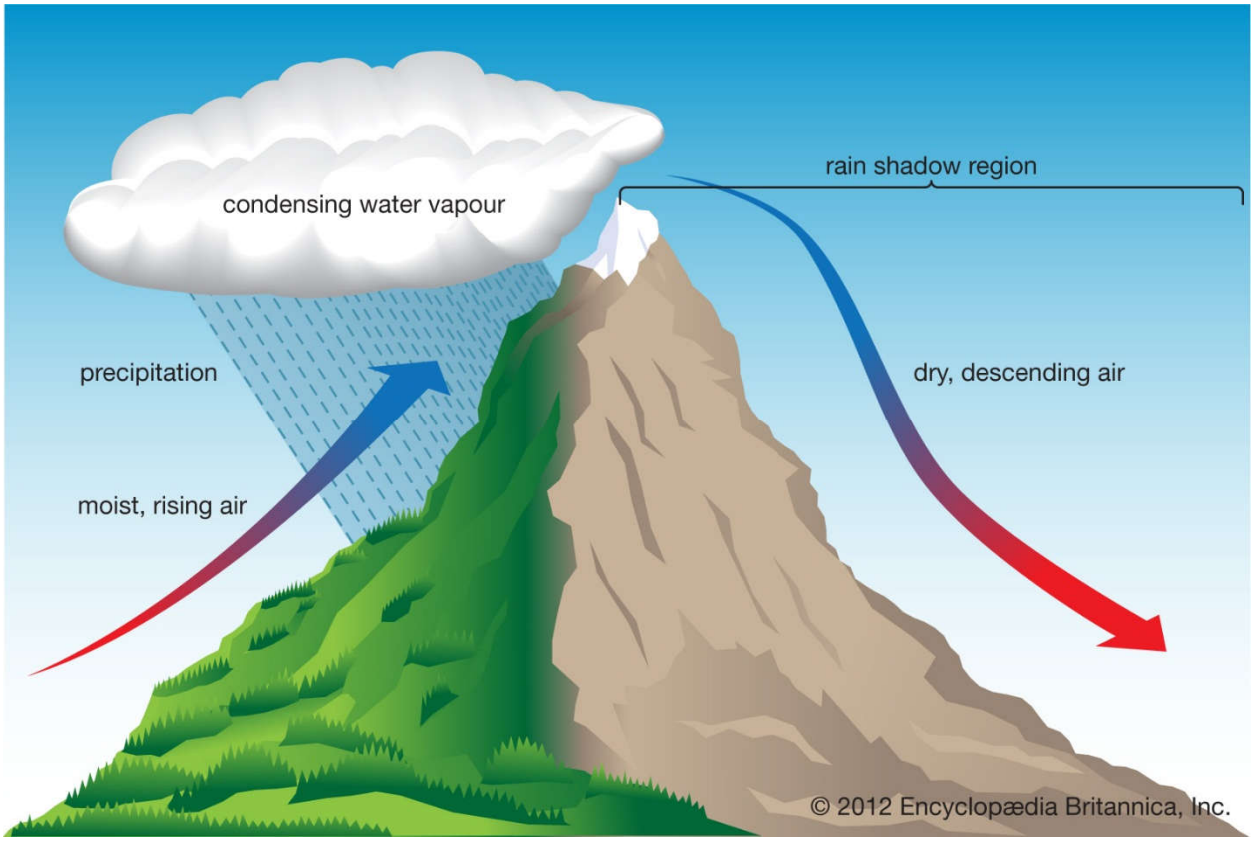
This is because there are few areas to be covered by the converging air. As the air converges, it condenses to form thick cumulous clouds. The rising clouds become heavier and unstable. This unstable cloud then drops to the ground as raindrops or rainfall. This type of rainfall is common in West Africa and is followed by lightning and thunderstorms.



1.1.2. Orographic or Relief Rainfall

When wind forces moist air landwards towards mountainous terrain, the mountain lifts the moist air masses high into the atmosphere. Once the air rises, it cools and allows precipitation to occur. As the wind or water vapor rises, they become unstable and heavy. They develop around condensational nuclei and form thick clouds. They rise further and become unstable water droplets.

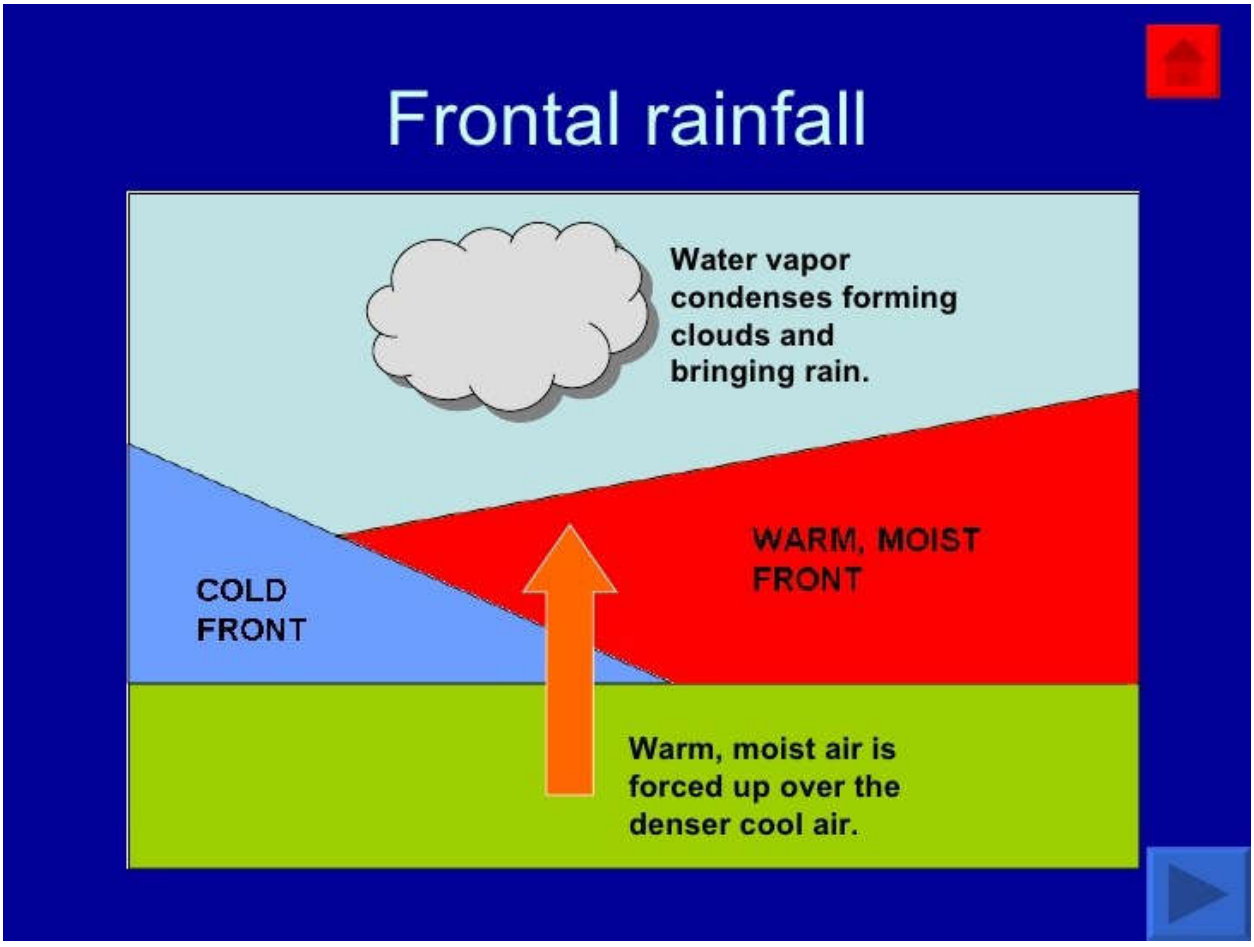
They fall to the ground as raindrops. This type of rainfall mostly occurs at the areas facing the hill or mountain called the **windward** side. The opposite side or **leeward side** receives the descending dry air and low or no rain at times, it comes as droplets or in a form shower.



1.1.3. Cyclonic or Frontal Rainfall

Finally, Cyclonic Rainfall is the last type of rainfall and it is also known as frontal rainfall. This occurs when two air masses of different characteristics meet or come together. For instance, when a warm maritime air mass (lighter) meets a cold air mass (heavier), the warm air mass is under-cut by the cold air mass.

The warm air mass is forced to rise because it is lighter. The warm water vapor cools down as it rises. The rising air condenses, or condensation takes place, and clouds are formed on the condensation nuclei (particles in the air) in the atmosphere. As the clouds rise further, they become unstable due to more water droplets accumulating. They fall to the ground as cyclonic rainfall.



Storms, tornadoes and thunderstorm

1. Storms

Storms are associated with periods of strong often damaging winds, heavy flood-producing rainfall, thunder and lightning, heavy snowfall or blizzard conditions.

Storms are a meteorological event that can be studied to advance the science of meteorology. The study of storms can potentially save lives as scientists gain a better understanding of their nature.

2. Thunderstorms

A thunderstorm is produced by a cumulonimbus cloud that includes rain showers, lightning, and thunder.

They start when the sun heats the earth's surface and warms the layer of air above it. This warmed air rises and transfers heat to the upper levels of the atmosphere. As the air travels upward, it cools and the water vapor contained within it condenses to form liquid cloud droplets.

As air continually travels aloft in this way, the cloud grows upward in the atmosphere, eventually reaching altitudes where the temperature is below freezing. Some of the cloud droplets freeze into ice particles, while others remain "supercooled."

When these collide, they pick up electric charges from one another; when enough of those collisions happen, the big buildup of charge discharges, creating lightning.

Thunderstorms are most hazardous when rain decreases visibility, hail falls, lightning strikes or tornadoes develop.

3. Tornadoes

A tornado is a violently rotating column of air that extends down from the base of a thunderstorm to the ground.

When wind near the earth's surface blows at one speed and wind above that blows at a much faster speed, the air between them whips around into a horizontal rotating column. If this column gets caught in the thunderstorm updraft, its winds tighten, speed up, and tilt vertically, creating a funnel cloud.

Tornadoes are dangerous even deadly because of their high winds and subsequent flying debris.

4. Hurricanes

A hurricane is a swirling, low-pressure system that develops over the tropics with sustained winds that have reached at least 74 miles per hour.

Warm, moist air near the ocean's surface rises upward, cools, and condenses, forming clouds. With less air than before at the surface, the pressure drops there. Because air tends to move from high to low pressure, moist air from surrounding areas flows inward toward the low-pressure spot, creating winds.

This air is warmed by the ocean's heat and the heat released from condensation, so it rises. This starts a process of warm air rising and forming clouds and surrounding air swirling in to take its place.

Before long, you have a system of clouds and winds that begins to rotate as a result of the Coriolis effect, a type of force that causes rotational or cyclonic weather systems.

Hurricanes are the most dangerous when there is a big storm surge, which is a wave of seawater that floods communities. Some surges can reach depths of 20 feet and sweep away homes, cars, and even people.