

No Snow January in Himachal Pradesh

Why in news?

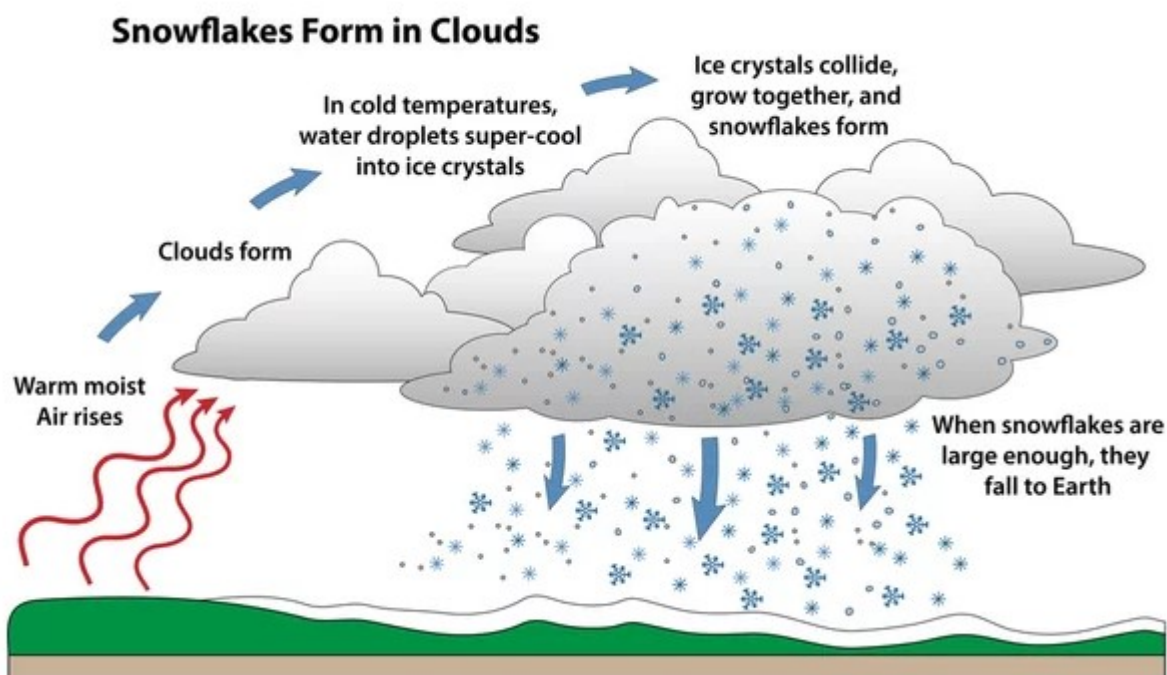
Records from the India Meteorological Department (IMD) suggest Himachal Pradesh has registered its driest January since 1901, with a 99.7% shortfall in January rain compared to what is normal.

What is snow?

- **Snow** - Snow is precipitation that falls in the form of ice crystals.
- The ice crystals are formed individually in clouds, but when they fall, they stick together in clusters of snowflakes.
- Snowflakes develop different patterns, depending on the ***temperature and humidity of the air***.
- Snow requires temperatures at the ground to be near or below freezing—***less than 0 degrees C (32-degrees Fahrenheit)***.

Precipitation is any type of water that forms in the Earth's atmosphere and then drops onto the surface of the Earth.

- **Formation of snow** - Water vapor, droplets of water suspended in the air, builds up in the Earth's atmosphere.
- Water vapor collects with other materials, such as dust, in clouds.
- Precipitation condenses, or forms, around these tiny pieces of material, called ***cloud condensation nuclei (CCN)***.
- Clouds eventually get too full of water vapor, and the precipitation turns into a liquid (rain) or a solid (snow).



What is the reason for the lack of snowfall?

- **Fall in the number of Western Disturbances** - [Western Disturbances \(WDs\)](#) are storms that originate in the **mid-latitude regions** and travel thousands of kilometres to bring rains across northern India.
- This is a non-monsoonal precipitation pattern driven by the **Westerlies**.
- When the temperatures are low, they result in snowfall and water being available as snow melt.
- Usually, 5 to 7 WDs affect Northwest India in the period from December to January, but this winter, there have been none.
- As a result, the Western Himalayan Region received 80% less rain than normal.
- **El Niño conditions over the equatorial Pacific Ocean** - [El Niño](#) is the warming of sea waters in Central-east Equatorial Pacific that occurs every few years (**Warm phase off the coast of Peru**).
- During El Niño, surface temperatures in the equatorial Pacific rise and this weakens the trade winds that blow near the Equator.
- In India, an El Niño event is strongly linked to suppressed rainfall.
- **Absence of a strong jet stream** - Jet streams are relatively narrow bands of strong wind (250 to 320 km/hr) in the upper levels of the atmosphere (about 12 km above mean sea level).
- Within jet streams, the winds blow from west to east, but the band often shifts north and south because jet streams follow the boundaries between hot and cold air.
- The **western cyclonic disturbances** which enter the Indian subcontinent from the west and the northwest during the winter months, originate over the Mediterranean Sea and are brought into India by the **westerly jet stream**.
- The arrival of these disturbances is often indicated by a rise in the night temperature.

Phenomenon	Effect on India
Western Disturbances	Gives rain

El Niño	Suppress the rain
Strong jet stream	Gives rain

References

1. [National Geographic | Snow formation](#)
2. [The Hindu | Himachal Pradesh's rainless January](#)

