



Western Disturbances

For Prelims: Western Disturbances, Caspian Sea, Mediterranean Sea, India Meteorological Department, Flash Floods, landslides, Cold Wave

For Mains: Physical Geography, Western Disturbances and its Unusual Behavior

Why in News?

Recently, the daytime's temperatures in Delhi were above normal in December 2022 because of fewer **Western Disturbances (WD)**.

- In winter, WD brings rain and snow over the hills, and **more moisture to the plains**. The cloud cover results in **higher minimum temperatures at night and lower day-time or maximum temperatures**.

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HIGHEST MAX TEMP IN DECEMBER

In degrees Celsius (°C)



What are Western Disturbances?

▪ About:

- Western disturbances are storms that originate in the **Caspian or Mediterranean Sea**, and bring **non-monsoonal rainfall** to northwest India, according to the [India Meteorological Department \(IMD\)](#).
- A Western Disturbance, labelled as **an extra-tropical storm originating in the Mediterranean**, is an area of low pressure that brings sudden showers, snow and fog in northwest India.
- The disturbance travels **from the “western” to the eastern direction**.
 - These travel eastwards on high-altitude [westerly jet streams](#) - massive ribbons of fast winds traversing the earth from west to east.
 - They **gradually travel across the middle-east from Iran, Afghanistan and Pakistan** to enter the Indian sub-continent.
- Disturbance means **an area of “disturbed” or reduced air pressure**.
 - Equilibrium exists in nature due to which the air in a region tries to normalise its pressure.

▪ Impact in India:

- A WD is associated with **rainfall, snowfall and fog** in northern India. It arrives with **rain and snow in Pakistan and northern India**.
- The moisture which WDs carry with them **comes from the Mediterranean Sea and/or from the Atlantic Ocean**.
- WD brings winter and pre-monsoon rain and is important for the development of the [Rabi crop](#) in the Northern subcontinent.
- The WDs are not always the harbingers of good weather. Sometimes WDs can cause extreme weather events like floods, [flash floods](#), [landslides](#), **dust storms**, **hail storms**

- **and cold waves** killing people, destroying infrastructure and impacting livelihoods.
- During the summer months of April and May, **they move across North India and at times help in the activation** of monsoon in certain parts of northwest India.
- During the monsoon season, western disturbances **may occasionally cause dense clouding** and heavy precipitation.
- Weak western disturbances are **associated with crop failure** and water problems across north India.
- Strong western disturbances can help residents, farmers and governments avoid many of the problems associated with water scarcity.



What have been the Recent Instances/Impact of WD?

- Excess rainfall was recorded in January and February 2022. In contrast, there was no **rainfall in November 2021 and March 2022**, and the summer **saw an unusually early start with heat waves** setting in at the end of March 2022.
- Multiple western disturbances that brought cloud cover **had also kept the maximum temperature low in February 2022**, when the lowest maximum temperature in 19 years was recorded.
- Active western disturbances eluded northwest India in March 2022, and absence of cloud cover and rain allowed temperatures to remain high.
- The **frequency of western disturbances has increased**, but not the precipitation associated with them, partly due to a warming atmosphere (**Global Warming**).
- In 2021, western disturbances **brought rain to Delhi in the first week of December**.
 - Delhi is, however, **likely to get colder with the maximum temperature likely to fall to around 24 degrees** by December 15, 2022.

Source: IE