Bow echo

Prelims: Indian Geography | General issues on Environmental ecology

Why in News?

The intense storm recently hit Delhi looked like a crescent or an archer's bow, in technical terms, such presentations of storms are called "bow echoes".

- A bow echo is ***essentially a line of storms***, also called a squall line, on the radar that looks like a bow.
- **Term coined by -** Ted Fujita, a Japanese American meteorologist known for developing the scale to classify tornadoesin the 1970s.
- This squall line can sometimes be embedded in a larger squall line.
- A bow echo can extend from ***20 km to 100 km***, and last between 3 and 6 hours.
- **Formation -** When rain-cooled air comes down to the ground, and spreads out horizontally.
- As this happens, a boundary called the gust front is created between the rain-cooled air and warm-moist air on the surface.
- This front pushes up the warm-moist air into the atmosphere, which forms new thunderstorms.
- These new thunderstorms produce more rain, thereby creating more rain-cooled air, which helps the gust front to maintain its strength.
- As this process keeps repeating itself, there comes a point when there is an inflow of air on the trailing side of the line of storms and bends it like an archer's bow.
- The cycle lasts as long as new thunderstorms keep forming at the front, helping the system grow and move forward with strong winds.
- Bow echoes are not a new phenomenon. In 2022, a bow echo was formed over Delhi and Noida. However, it was short-lived, lasting for an hour, and produced winds of up to 100 kmph.
- Such a squall line was observed during thunderstorm activity in Odisha earlier this month.

Reference

The Indian Express | Bow echo