Atmospheric River

Prelims – *Indian and world Geography, Physical geography.*

Mains (GS I) – *Salient features of world's physical geography.*

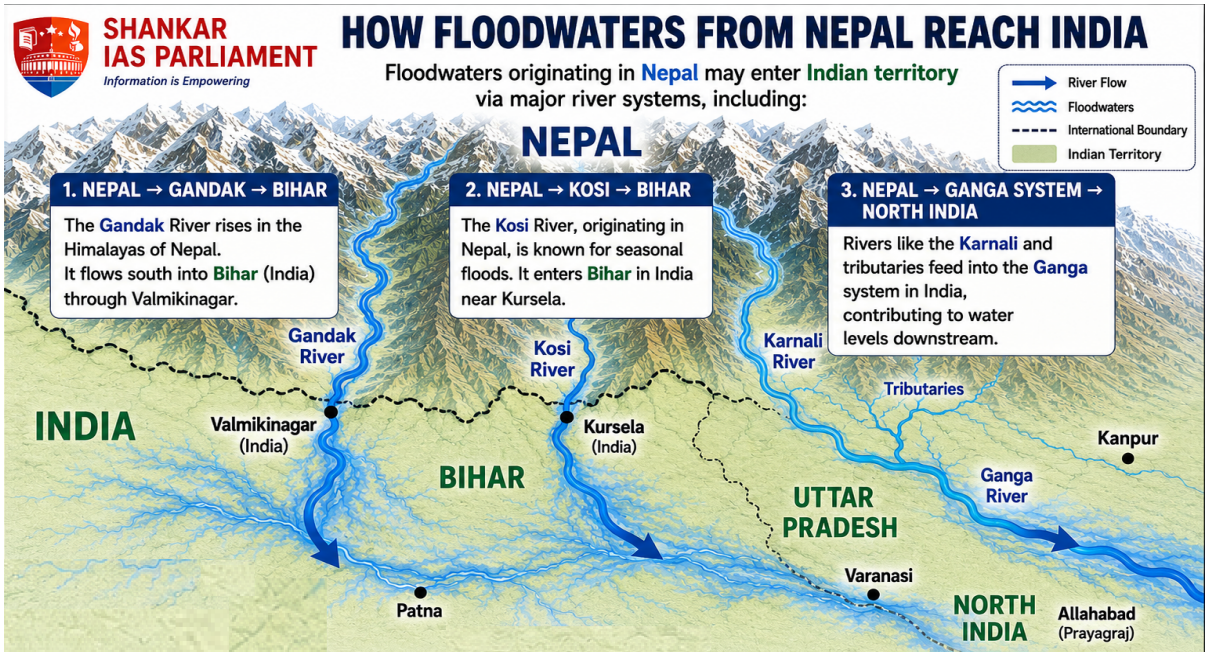
Why in news?

Recently United States witnessed heavy rain, strong winds and severe thunderstorms due to a type of storm known as an atmospheric river.

- **Atmospheric rivers** – They are a ***narrow, fast-moving band of moisture and wind*** like a river in the sky.
- It transport large amounts of water vapour.
- **Occurrences** – They occur all over the world but *most common in the mid-latitudes.*
- **Formation** – They form when large-scale weather patterns create narrow channels of intense moisture transport.
- They ***start over warm water*** typically tropical oceans, and are and guided towards the coast *by low-level jet streams* ahead of cold fronts of extratropical cyclones.

Extratropical cyclones *are also called wave cyclone or mid-latitude cyclone or temperate cyclones.*

- **Characteristics –** It can vary in size and strength
  - **Width** - 402-606 km
  - **Length** - Can exceed 1600 km



*The "**Pineapple Express**" is one of the strongest known atmospheric rivers, carrying moisture from tropical Pacific near Hawaii to the North American west coast.*

- **Impact** – While providing essential rainfall, it can also cause,
  - Flooding
  - Mudslides
  - Hurricane-like conditions
  - Property damage

According to the National Oceanic and Atmospheric Administration (NOAA), when atmospheric rivers pass over land they can cause conditions similar to those of hurricanes with intense and rapid rainfall, cyclone force winds, and significantly increased wave heights.

Impact of Climate Change on Atmospheric River

- **High moisture retention** – With global temperatures soaring, *more water is evaporating* into the air.
- As warmer air can hold more water vapour for every 1°C rise in average temperature, the *atmosphere can hold about 7% more moisture.*
- **Increase in intensity** – More moisture can lead to increase in precipitation intensity, which ultimately causes severe flooding across the world.
- **More frequent atmospheric river** – NASA's 2018 study projected atmospheric rivers becoming significantly longer and wider, leading to more frequent atmospheric river conditions.

Reference

[The Indian Express| Atmospheric River]