Rapid Ice Melt in West Antarctica

Why in news?

A new study has pointed out that rapid melting of West Antarctica's ice sheet due to warm waters around it, is now unavoidable, no matter how much carbon emissions are cut.

What is an ice sheet?

- **Ice sheet** - An ice sheet is essentially a mass of glacial ice that covers *more than 50,000 square kilometres* of land.
- Ice sheets contain about 99% of the fresh water on Earth, and are sometimes called *continental glaciers.*
- Major ice sheets include
    - **Antarctica ice sheet**- World's largest volume of land-based ice
    - **Greenland ice sheet**
- **Ice shelf-** As ice sheets extend to the coast and over the ocean, they become ice shelves.
- **Ice cap**- A mass of glacial ice covering less area than an ice sheet is called an ice cap.
- **Ice field**- A series of connected ice caps is called an ice field.
- **Individual glaciers**- They make up the ice fields, ice caps, and eventually ice sheets.
- **Sea ice** – It is the free-floating ice that surrounds the polar regions created by sea water freezing.

What is the recent study about?

> *The study, 'Unavoidable future increase in West Antarctic ice-shelf melting over the twenty-first century', quoted the reasons for the rapid ice melt in West Antarctica.*

- The scientists have used a high-resolution computer model of the ***Amundsen Sea,*** the most vulnerable sector of the ice sheet, to provide comprehensive assessment of warming in West Antarctica.
- **Findings** - Amundsen Sea will warm roughly *3 times faster than the historical rate* through the rest of this century leading to much more rapid melting of ice shelves.
- The study worsens the outlook for ***Thwaites Glacier*** that is rapidly melting beneath its connected ice shelf.
- The processes triggered by faster ice shelf melting could lead to the collapse of the West Antarctic Ice Sheet.
- If lost completely, the ice sheet would raise the global mean sea level by *5.3 metres or 17.4 feet,* a devastating consequence for people living in coastal cities across the world, including in India.

How the West Antarctic ice sheet is melting?

The Antarctic ice sheet contains enough ice to raise global sea-levels by about 58m (190ft) if it melted entirely. Of this, a sizeable portion enough to raise sea-levels by around 5m (16ft), is held in West Antarctica.

- **Ocean currents -** Strengthening of ocean currents drives more warm water from the deep ocean towards the shallower ice shelves along the coast.
- **Thinning of ice shelf**- If an ice shelf thins or disappears, these glaciers tend to speed up, discharging more ice into the ocean and causing sea level rise.
- The region's ice shelves have been depleting, glaciers have been flowing faster towards the ocean and the ice sheet has been shrinking.
- Thwaites glacier is referred as the "***doomsday glacier***" because it would raise global sea-levels by around 65cm if it collapses entirely.

References

1. Indian Express- Ice sheet melt in West Antarctica
2. BBC | West Antarctic ice shelf melt 'unavoidable'

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