Antarctica’s Doomsday Glacier

Why in news?

Recently, the melting of Doomsday Glacier in Antarctica is a cause of concern because of its high potential in speeding up the global sea level rise.

What is the glacier and why is it important?

- Doomsday Glacier also called as thwaites Glacier situated in Antarctica which is 120 km wide at its broadest, fast-moving.
- It is important for Antarctica as it slows the ice behind it from freely flowing into the ocean.
- Due to its large size, it contains enough water to raise the world sea level by more than half a metre.
- It is found that amount of ice flowing out of it has nearly doubled over the past 30 years and now it’s melting at faster rate due to the supply of warm water flowing underneath.
- Now the thwaites’s glacier melting has contributed to 4% of global sea level rise and it is estimated that the glacier would collapse into the sea in 200-900 years.
- Due the risk it faces and poses, thwaites is often called the Doomsday Glacier.

What did the previous studies say about the glacier?

- A 2019 study had discovered a fast-growing cavity in the glacier and deployed an ocean-sensing device called Ice Fin to measure the waters moving below the glacier’s surface.
- In 2020, researchers from New York University (NYU) detected warm water at a vital point below the glacier which reported that the water at just two degrees above freezing point at thwaites’s grounding line.
- The grounding line is the place below a glacier at which the ice transitions between resting fully on bedrock and floating on the ocean as an ice shelf.
- The location of the line is a pointer to the rate of retreat of a glacier.
- When glaciers melt and lose weight, they float off the land leading to retreating of the grounding line.
- This exposes more of a glacier’s underside to seawater thereby accelerating the melting process.

- This results in the glacier stretching out and thinning thereby causing the grounding line to retreat ever further.

What has the new study revealed?

- The new study used an uncrewed submarine to go under the thwaites glacier front to make observations.
- The submersible called Ran was used to measure the strength, temperature, salinity, oxygen content of the ocean currents that go under the glacier.
- Using the results, the researchers mapped the ocean currents that flow below thwaites's floating part.
- They also identified three inflows of warm water among them one has the potential to create severe damage which is underestimated in the past.
- The study also looked at heat transport in one of the three channels which brings warm water towards the glacier from the north.

Why is this a cause of worry?

- The study shows that warm water is approaching the pinning points of the glacier from all sides.
- This will impact the locations where the ice is connected to the seabed and places where the ice sheet finds stability.
- This can also make things worse for thwaites glacier, whose ice shelf is already retreating.
- But with the current data scientist can model the dynamics of thwaite's glacier which can help in calculating the ice melting in the future.
- This will reduce the great uncertainty that now prevails around global sea level variations.

Source: The Indian Express