

Combating Climate Extremes

What is the issue?

\n\n

In early 2017, **unprecedented rates of glacier melts** have been reported both in the Antarctic and the Arctic.

\n\n

What had happened in the past?

\n\n

\n

- The earth has enjoyed a more or less stable temperature for the last 10,000 years.

\n

- Prior to that there were several ice ages and periods of warmer temperature, also known as **inter-glacials**.

\n

- The ice ages are believed to have been caused **by small shifts in the earth's orbit**, but all the reasons for the temperature fluctuations observed are not yet entirely understood.

\n

- During the Pliocene epoch, global sea levels were close to 30 metres higher than they are today, while average global temperatures were only about 3-4 degrees Celsius warmer.

\n

\n\n

What is happening in Antarctic at the moment?

\n\n

\n

- The Antarctic ice sheet is 14 million sq km in area and holds a large amount of frozen fresh water.

\n

- If all the ice over the Antarctic were to melt, sea levels would rise by about 60 metres.

\n

- Several media reports have covered the expanding rift or crack along the **Larsen C shelf** in the Antarctic, which is expected to break off at any time.
\n
- Normally, ice shelves lose mass by the breaking off, or calving, of some of the portions and also by melting.
\n
- When such large chunks break away from an ice shelf, **they speed up the collapse of the entire shelf.**
\n
- Since this is attached to the rest of the glacier, these processes can increase the speed at which the glacier flows into the ocean.
\n
- Thus, even though the Larsen C collapse by itself, **since it is in the water, will not raise sea levels**, it will hasten the melting of the glacier it is connected to.
\n
- While the entire West Antarctic Ice Sheet may take a few hundred to a thousand years to completely melt, the process and **the resultant collapse are now recognised as unstoppable.**
\n

\n\n

What is happening in Arctic at the moment?

\n\n

- \n
- In the Arctic, if all the ice in the Greenland ice sheet were to melt, it would raise global sea levels by about 7 metres.
\n
- For the last several years, glaciologists have noticed that ice melt in the summer has increased and they say a lot of the recent melt has been due to increasing surface melt, and calving or breaking off of chunks of ice.
\n
- **Soot and dust** carried by air from various places, bacteria and algal pigments in the meltwater, any other pigments in the glacier can all **reduce the reflection of the sunlight**, thus increasing the absorption of heat energy by the ice.
\n
- This consequently increases ice melt, which then absorbs more solar radiation, thus **accelerating a feedback process.**
\n
- The meltwater flows into deep shafts, or moulins, that then **speed up the flow of the glacier.**

\n

- Also, temperatures in Northern Greenland have been much warmer and in fact, surface melt has doubled Greenland's contribution to sea level rise over the period 1992-2011.

\n

- Carbon dioxide concentrations have crossed 400 ppm in the atmosphere and are the highest they have been in the past 4,00,000 years.

\n

\n\n

How vulnerable is India?

\n\n

\n

- Protecting the coast is an expensive undertaking and even then dikes, sea walls and similar structures provide only partial protection, based on studies undertaken by the **Dutch Delta Committee**.

\n

- For India, **the east coast**, especially certain low-lying districts, are extremely vulnerable to intensive storms, which then lead to flooding, salt-water intrusion, and loss of land and livelihoods.

\n

- **On the west coast**, while there are generally fewer storms, the concern is coastal erosion and flooding from sea level rise.

\n

- The discussion regarding sea level rise and potential coastal impacts needs also to be understood not just as a coastal phenomenon, but also as an **issue that ripples through the entire economy**.

\n

- Flooding in Chennai two years back did not affect just the land, but went through the economy as a whole and a reinsurance company, has estimated losses to be \$2.2 billion.

\n

\n\n

What is the way forward?

\n\n

\n

- Thus, enforcing the coastal regulation zone, protecting vulnerable districts and vulnerable communities which rely on ecosystems and the sea for their livelihoods are areas that need strengthening.

\n

- **Regional agreements related to refugees from climate effects** need to be initiated.
- As a country which has generally been open to refugees, initiating and taking forward the conversation on regional planning for extreme events such as sea level rise would be important for India.

Source: The Hindu

