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NINE REASONS WHY GLOBAL CLIMATE TIPPING POINTS MAY HAVE BEEN OVERSHOT ALREADY

Relevant for: Environment | Topic: Environmental Degradation - GHGs, Ozone Depletion and Climate Change

Icebergs and ice float in the Ilulissat Icefjord on August 04, 2019 near Ilulissat, Greenland. Climate change is having a profound effect in Greenland, where over the last several decades summers have become longer and the rate that glaciers and the Greenland ice cap are retreating has accelerated. | Photo Credit: Getty Images

Climate change awareness is growing among all quarters, and yet, have we really come to terms with the magnitude of the crisis? A comment article in *Nature*, published on November 27, draws attention to the alarming possibility that certain climate thresholds related to the earth as a system may be on the verge of being breached. It also argues that this effect may be worse than anticipated by earlier reports and agencies. The study points out nine such elements which may be closer to the tipping point that calculated and worse, that they may be interlinked in a way that has a global cascading effect.

Ice sheets in the East Antarctic, the West Antarctic and Greenland may be dangerously close to the tipping point, if they have not already crossed them, according to the analysis. A study shows that the West Antarctic ice sheet could be set off on a route to collapse when the Amundsen Sea Embayment melts. This could raise the sea level by about 3 metres on a timescale of centuries to millennia. Models of the East Antarctic ice sheet suggest that it could add 3-4 metres to the sea level on timescales beyond a century. As for the Greenland ice sheet, the study reports that it could add 7 metres to the sea level over a thousand years, and that models pin the tipping point at 1.5 degrees Celsius. This could happen even by 2030.

Biospheres under threat can cause serious damage to ecosystems and livelihoods. Not only this, they can trigger abrupt releases of CO2 into the atmosphere, thereby increasing the pace of climate change. Coral bleaching due to warming of the oceans have harmed nearly half the shallow water corals of the Great Barrier Reef. Such warming can imperil 99% of tropical corals, according to a projection. The Amazon rainforest – a hotbed of diversity – is another case in point. According to earlier estimates, the tipping point of deforestation ranges from 40% to 20% tree cover loss. The authors point out that about 17% has been lost since 1970 – this is a rate that should set alarm bells ringing. Other factors such as thawing permafrost can release CO2 and methane into the atmosphere, exacerbating global warming, which it turn can worsen all of the above.

The authors draw attention to a rapidly shrinking carbon budget if we take the above factors into account. They write: “Some scientists counter that the possibility of global tipping remains highly speculative. It is our position that, given its huge impact and irreversible nature, any serious risk assessment must consider the evidence, however limited our understanding might still be.”

“I consider this an informed comment, not as a speculative piece,” says Roxy Mathew Koll, a climate scientist at the Indian Institute of Tropical Meteorology, Pune, and lead author of a recent Intergovernmental Panel on Climate Change (IPCC) Special Report on Oceans and Cryosphere in a Changing Climate. “One of the new points which we came out with, after assessing multiple papers with multiple observations and model simulations, is that the frequency and magnitude of marine heat waves in the ocean has increased significantly.”

These are heatwaves on the ocean. “Multiple occurrences of these heatwave bleach the corals

and kill them. If we don't cut the carbon emissions by significant amounts, a one-in-100-day event (with pre-industrial CO2 levels) is projected to become a one-in-four-day event by 2050 and a one-in-two-day event by 2100," explains Dr. Koll.

The authors write: "… the intervention time left to prevent tipping could already have shrunk towards zero, whereas the reaction time to achieve net zero emissions is 30 years at best." And they end with this appeal: "The stability and resilience of our planet is in peril. International action — not just words — must reflect this."

The bottom line is to strive not for stopping global warming at 3 degrees Celsius but to control it still further to less than 2 degrees.

Residents of Ghoramara are being forced to migrate as the small island is slowly being submerged by the sea. Now environment experts warn that the neighbouring islands of Ganga Sagar and Mousuni are facing a similar fate.

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