

Planet at risk of becoming 'hothouse'

Domino effect of climate change could make many places unlivable within decades, study warns

Cascading dominoes

Different aspects of our Earth System could switch from neutral or helpful to harmful, dumping more CO₂ into the air than all human activity. They are interconnected and the collapse of one could trigger another.

WEAKENED CARBON 'SINKS'

Forests and oceans have together absorbed more than half of carbon pollution over the last several decades. But forests are shrinking, and oceans are showing signs of CO₂ saturation.

(NOT SO) PERMAFROST

Methane and CO₂ trapped in the permafrost of Russia, Canada and northern Europe is equivalent to 15 years of emissions. The release of these gases would speed up global warming and, in effect, hasten their own escape.

FOREST 'DIEBACK'

Global warming of 3 C could condemn 40 per cent of the Amazon forests to dieback. Fires could hasten this. These forest dieoffs would release billions of tons of carbon into the air.

WASHINGTON: The planet urgently needs to transition to a green economy because fossil fuel pollution risks pushing the Earth into a lasting and dangerous "hothouse" state, researchers warned on Monday.

If polar ice continues to melt, forests are slashed and greenhouse gases rise to new highs -- as they currently do each year -- the Earth will pass a tipping point.

Crossing that threshold "guarantees a climate 4-5 Celsius (7-9 Fahrenheit) higher than pre-industrial times, and sea levels that are 10 to 60 meters (30-200 feet) higher than today," cautioned scientists in the *Proceedings of the National Academy of Sciences*.

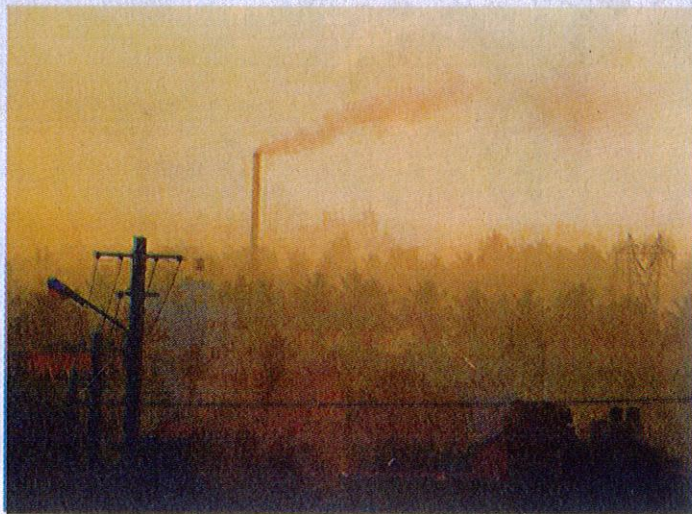
And that "could be only decades ahead," they said.

"Hothouse Earth is likely to be uncontrollable and dangerous to many," said the article by scientists at University of Copenhagen, Australian National University and the Potsdam Institute for Climate Impact Research.

Rivers would flood, storms would wreak havoc on coastal communities, and coral reefs would be eliminated — all by century's end or even earlier.

Global average temperatures would exceed those of any interglacial period — warmer eras that come in between Ice Ages — of the past 1.2 million years.

Melting polar ice caps would lead to dramatically higher sea



levels, flooding coastal land that is home to hundreds of millions of people. "Places on Earth will become uninhabitable if 'Hothouse Earth' becomes the reality," said co-author Johan Rockstrom, executive director of the Stockholm Resilience Centre.

Where is the tipping point?

Researchers suggest the tipping point could come once the Earth warms to 3.6 Fahrenheit (2 Celsius) over pre-industrial times. The planet has already warmed 1 C over pre-industrial times, and is heating up at a rate of 0.17 C per decade.

The "Perspective" article is

based on previously published studies on Earth's tipping points.

The scientists also examined conditions the Earth has seen in the distant past, such as the Pliocene period five million years ago, when CO₂ was at 400 ppm like today.

During the Cretaceous period, the era of the dinosaurs some 100 million years ago, CO₂ levels were even higher at 1,000 ppm, largely due to volcanic activity.

To state that 2 C is a no-return threshold "is new," said Martin Siebert, co-director of the Grantham Institute at Imperial College London, who was not involved in the study.