Level 1 What is climate change?

WE OFTEN MAKE the mistake of saying the climate of a city or country is hot. Little do we realise that it's actually the weather we are speaking about and not the climate.

So, what do we mean by climate? Our Geography books have informed that the world is divided into five climatic regions— the tropical, dry, temperate, cold and polar. Several factors like temperature, humidity and precipitation determine the type of climate a region has.

The weather is also determined by the same parameters but it is on a smaller scale, say the next day or the following week. Climate, on the other hand, is used for making bigger predictions. Climate, thus, refers to "average weather".

Now, every year summer is expected to last four months, from

March to June, and monsoon, from July to September. When there are changes in this cycle, which is what is happening today, we say the climate is changing.

But the changes in climate have been taking place since ancient times. So what is different? In 1992, the United Nations Framework Convention on Climate Change (UNFCCC), an international environmental treaty, gave us an answer with the following definition:

"Climate change is a change of climate which is attributed directly or indirectly to human activity that alters the composition of the global atmosphere and which is in addition to natural climate variability observed over comparable time periods."

These changes, which as the

Intergovernmental Panel on Climate Change (IPCC), an intergovernmental body of the United Nations an intergovernmental body of the United Nations observed in 2007, are due to a mix of internal and external factors. Together, they lead to extreme weather events like flash floods, hurricanes, droughts, etc. The only difference is that now humans play a big role in altering the Earth's atmospheric composition.

And how do we do this? Simple, our constant pursuit of energy has led us to fossil fuels, which we use rampantly to satisfy our needs.

At first it was coal and then steam power, but soon we discovered other fossil fuels like petroleum and natural gases. With the burning of fossil fuels, carbon dioxide (CO_2) is produced and we know that it's a greenhouse gas (GHG).

Thanks to our mindless burning of fossil fuels, we have damaged our atmosphere beyond repair. The excess emission of co_2 leads to global warming, which has now become a threat to the very existence of life on Earth!

2019 is set to become the fourth warmest year after 2015, the World Meteorological Organization (WMO) has warned. This comes as no surprise as the world has seen 20 of its warmest years in the last 22 years. Also, emission rates of GHGs reached a record high in 2018. The same year, the World Bank came out with a warning for India that changes in temperature and rainfall would impact the lives of 600 million people across the country.

In order to have any chance of limiting global warming to 1.5° C above pre-industrial levels, as prescribed by the Paris Agreement, nations have time till 2030 to effect a complete transition in economy and society. The IPCC special report on 1.5° C is sure about one thing, i.e., unless net co₂ emissions are brought down to zero by 2050, warming above 1.5° C is practically inevitable.

The story of Superman, in the "Complete Story of the Daring Exploits of the One and Only Superman", begins with his parents sending him away from planet Krypton that was headed towards its destruction, and eventually perished. Alas! We don't have a second Earth to escape to. We can still take effective steps to preserve our planet Earth, and avoid the end Krypton met.



An unpredictable meltdown

he world loses around ₹7,00,000 crore per year to floods, states the United Nations Human activities like deforestation and urbanisation are worsening the impact of floods. In a first, a new study has linked global warming to floods across Europe. A study of data on European rivers from 1960-2010 showed that global warming causes snow to melt sooner and faster. As a result, flash floods are occurring earlier than usual along the Atlantic coast, from Portugal to England, and later than usual around North Sea and parts of the Mediterranean. We have squeezed rivers to make way for cities. As rainwater runs off faster from concrete, there is a greater risk of flash floods.

Desert underwater

Former UN Secretary General, late Kofi Annan, had once said, "On climate change, we often don't fully appreciate that it is a problem. We think it is a problem waiting to happen."

While world leaders are focusing on how humanity will be affected by climate change in the years to come, we've failed to see how it's impacting us today.

A recent example is



that of extreme rainfall and flooding in the desert states of Rajasthan and Gujarat. Heavy rainfall in July 2018 reportedly killed hundreds and affected lakhs of people in these states.

Scientists are still not sure if climate change is to blame for the floods. But it surely indicates the risk of extreme weather events.

Test the thunder!

Researchers say global warming is causing frequent and highintensity thunderstorms.

4. When the surface of the Earth is way hotter than usual, more hot air rises and cold air gushes in from far off places such as moisture-laden air from the water bodies of Eurasia. This phenomenon is also known as the Western Disturbance. But in 2018, moisture-laden air was also pulled from the Bay of Bengal **5.** The hot air slowly turns cold as it rises. When the moisture-laden air rises up the air column, it forms clouds which eventually causes rainfall. The temperature gradient between the cold air and the hot air is what fuels a thunderstorm

Freezing point

Western disturbance

3. Once the hot air goes up, cold air from adjoining places takes its place

2. The hot air from the surface rises up and carries sand/dust particles with it as it rises causing dust storms Vinds from Bay of Benga

Sun heats up the surface of Earth