

# Making Sense of



# Climate Change

*A BEGINNER'S GUIDE TO GLOBAL WARMING*

# Making Sense of Climate Change

A beginner's guide to global warming

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# Foreword

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Children have a larger stake in tackling the challenge of climate change than adults, largely because if we do not take timely and effective action, the impacts of climate change would get much worse over time. This would affect the lives of today's children, who by the time they become adults would have to face some of the worst consequences of climate change in every aspect of their lives. It is becoming increasingly clear that climate change is resulting in an increase in the frequency and intensity of extreme events such as floods, droughts, heatwaves, and extreme precipitation events. Warming of the earth is leading to the melting of large bodies of ice across the planet and thermal expansion of the ocean, as a result of which sea level is rising. This would affect hundreds of millions of people in several parts of the planet. In fact, if any part of the ice sheets in western Antarctica and Greenland were to collapse, it may cause a sea-level rise of several metres. This would not only devastate large coastal areas across the globe and submerge several small island states, but also turn hundreds of millions of people into climate refugees. All of this could lead to conflict and threaten peace in the world.

Schoolchildren need to understand the gravity of this challenge. They can put pressure on their elders to bring about major lifestyle changes and influence social actions and government policies by which we can bring about rapid and large-scale reduction of emissions of greenhouse gases. The sooner we take effective measures in this direction, the greater the probability of avoiding the worst impacts of climate change. I am happy to introduce the book *Making Sense of Climate Change*, and I hope children not only in India but in other countries also would read the contents of these pages and take them to heart in responding with action. We need to give the children of today a bright, safe, and secure future.



(R K Pachauri)

Director-General, TERI, and  
Chairman, Intergovernmental Panel on Climate Change



The weather is an important part of our daily life, and it comes up in our conversation or in our thoughts a number of times during the course of the day. We often make remarks such as ‘Lovely weather!’ or ‘It is very cold/hot today.’ or ‘Do you think it might rain today?’ and so on. On the other hand, we never give the climate any serious thought in our daily lives unless we are confronted with some unusual phenomenon or noticeable change in weather patterns, such as long, dry spells, very heavy rains, raging storms, and so on. This is because unlike changes in the weather, which can occur very suddenly, changes in the climate take a long time to settle in. The climate of a given place is, in simple terms, the average weather experienced in that place over a period of time.

Yet, wherever we may live, the climate has somehow changed from what it used to be, say 10 years ago. There has definitely been a change, but it has been so gradual that we have not felt or seen it happening. Therefore, we have not given it a thought!

This change in the climate is now a great challenge facing humankind. Undoubtedly, it is the single largest environmental threat facing the planet, and we need to act fast to mitigate it. There is much that needs to be done and much that can be done to halt the catastrophic impacts of climate change. However, these steps have to be taken by all sections of human society, throughout the world.

The climate anywhere on our planet can be well described as the result of a delicate balance between the following elements—sun, atmosphere, oceans, water systems, plants, living organisms, and topography, or surface features. All these are involved in a complex interaction, which results in the correct balance. The most important factors that are taken into account are rain, sunshine, humidity, wind, and temperature. A planet’s overall climate is decided by its mass, its distance from the sun, and the composition of its atmosphere. Climate is the average weather of a region or area over a period of time. In fact, it is often said that the climate is what we expect and

the weather is what we get! When we talk about understanding climate, we mean not only looking into the past but also looking around us. We see how the weather changes from season to season and from year to year. It usually varies within limits and is generally seen as a stable pattern.

Changes in climate have been witnessed in the last 150 years, and though they have been very gradual, there is definitely a trend towards global warming, leading to other related impacts. As the temperature increases, it leads to changes in many aspects of the weather such as wind and precipitation patterns, amount, and distribution. All the changing trends could have far-reaching and unpredictable environmental consequences.

Changes in the climate occur due to various factors—both natural and anthropogenic (resulting from or produced by human activities). Human activities like carbon dioxide, methane, nitrous oxide, and water vapour are altering the chemical composition of the atmosphere by adding more and more GHGs (greenhouse gases) to it. These gases absorb and trap the sun's heat, leading to global warming. The global impact of this human-induced and aggravated climate change is open to debate; opinions vary about the level of change and its implications.

Various groups across the world have been meeting regularly to chalk out plans and ways to control and bring a halt to this increasing trend towards global warming. The United Nations has taken a leading role in coordinating and initiating such meetings. In 1989, the IPCC (Intergovernmental Panel on Climate Change) was set up by the WMO (World Meteorological Organization) and UNEP (United Nations Environment Programme) to compile reliable, scientific data on climate change, its causes, and consequences. A 1995 study by the IPCC states, 'The balance of evidence suggests that there is a discernible human influence on global climate change'.

According to the IPCC report it is 'unequivocal' that the earth's climate is warming, 'as is now evident from observations of increases in global average air and ocean temperatures, widespread melting of snow and ice, and rising global mean sea level.' It also confirms that the current atmospheric concentration of carbon dioxide and methane, 'exceeds by far the natural range over the last 650 000 years.' The report also states the following about rising temperatures.

- Eleven of the last 12 years rank among the 12 hottest years on record (since 1850, when sufficient worldwide temperature measurements began).

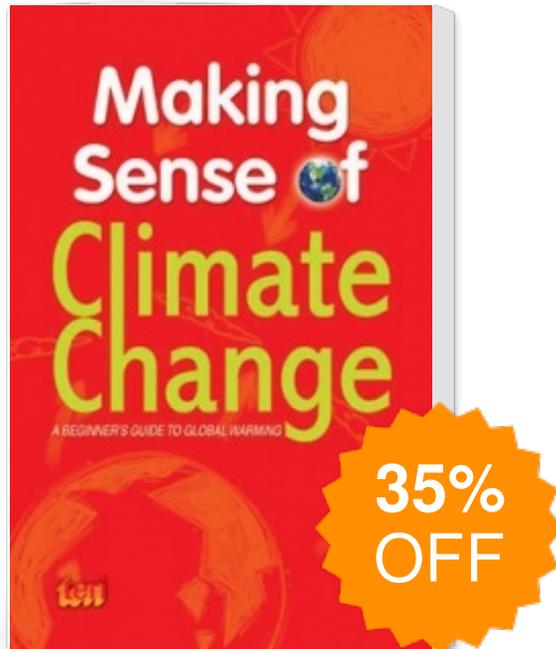
- Over the last 50 years, ‘cold days, cold nights, and frost have become less frequent, while hot days, hot nights, and heatwaves have become more frequent.’
- Warming, particularly since the 1970s, has generally been greater over land than over the oceans.

### **IPCC: keeping an eye on climate change**

The IPCC (Intergovernmental Panel on Climate Change) is a scientific intergovernmental body set up by the WMO (World Meteorological Organization) and UNEP (United Nations Environment Programme) to provide independent scientific advice on the complex and important issue of climate change. The Panel was asked to prepare, based on available scientific information, a report on all aspects relevant to climate change and its impacts and to formulate realistic response strategies. The IPCC provides its reports at regular intervals and they immediately become standard works of reference, widely used by policy-makers, experts and students. Till date, it has produced four assessment reports—in 1990, 1995, 2001, and 2007.

The IPCC’s headquarters are in Geneva, Switzerland. On 10 December 2007, the IPCC, along with former US Vice-president Al Gore, was awarded the Nobel Peace Prize ‘for their efforts to build up and disseminate greater knowledge about man-made climate change, and to lay the foundations for the measures that are needed to counteract such change.’

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