

Climate change

Concept: Climate change

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Description The term "climate change" refers to medium- to long-term changes in the Earth's global or regional average weather patterns. The Earth's climate has undergone many changes over the billions of years of its existence as, for example, warm areas have become frozen during ice ages. Periods of warming and cooling, changes in rainfall patterns, and other variations associated with climate change can be caused by many factors, including volcanic eruptions, variations in solar radiation, the growth and diminishment of glaciers, and the presence of greenhouse gases in the Earth's atmosphere.

Over the last few decades, scientists have raised concerns about the amounts of carbon dioxide, methane, and other greenhouse gases that human beings are releasing into the atmosphere through our use of coal-burning power plants, automobiles, factories, worldwide shipping routes, and other sources (many of which have gone hand in hand with globalization). The consensus among scientists studying the Earth's climate is that the Earth is currently undergoing a period of warming, and that human activity is making a significant contribution to this warming. The Intergovernmental Panel on Climate Change (IPCC), an organization established by the United Nations and the World Meteorological Association, published a report in 2001 cataloguing the recent changes in the Earth's climate and providing evidence which suggests that "most of the warming observed over the last 50 years is attributable to human activities" (IPCC 2001, 9). In 2004, the Pentagon commissioned a study that concluded that the most severe threat to human civilization in the twenty-first century is not terrorism, but climate change brought about by human use of fossil fuels. Climate change itself is not a new phenomenon on Earth, but the unprecedented rate of change makes the current period of warming cause for such concern. While a minority of researchers argue that human activity is not changing the Earth's climate, or that more time is needed to determine whether or not human-induced climate change is significant, most debate around climate change is now focused on the degree to which human activity is causing the climate to change, and on what should be done to counteract or prepare for these changes.



(Photo: IDRC-CRDI)

Even among those who support the consensus view, though, opinions are divided on how urgent the situation is, and on the extent to which it is wise or necessary to make short-term sacrifices to economic growth in order to reduce greenhouse gas emissions. A minority of researchers have even suggested that we may already have passed a global point of no return: that the greenhouse gases humanity has already produced have placed us on an unstoppable route towards disastrous climate change. Responses to this spectrum of concerns are happening at local, national, and international levels. Locally, many governments and organizations are encouraging individuals to reduce the greenhouse gas emissions for which they are directly or indirectly responsible. Some governments are placing legal restrictions on the amount of greenhouse gases produced by corporations, manufacturing processes, and consumer goods such as automobiles. At the international level, the Kyoto Protocol is the largest organized response to the threat of climate change.

While the term "global warming" is connected with the idea of climate change, the latter term is often preferable since it does not suggest that the issue is as simple as an increase in temperature. The consequences of climate change are much more complex, and may include droughts, flooding, rises in sea level, increased severity of storms, regional decreases in temperature, changes in fish and animal populations, extinctions, loss of crops, human deaths (caused directly through heat waves and droughts, and indirectly through increased spread of infectious diseases), and human conflict in the face of changing availability of resources. Also, while the term global warming is usually used with the

assumption of human causation, the term climate change can refer to any variations in the Earth's climate, regardless of cause. Some writers use the term "anthropogenic climate change" to refer specifically to human-induced climate change, while others assume human influence in any discussion of recent or ongoing climate change.

It is also important to distinguish climate from weather. While weather refers to short-term outcomes (for example, "It may rain on Thursday"), climate refers to the accumulated average of weather conditions over long periods of time (for example, "Egypt is hot"). Because it may be normal for regions with cold climates to experience instances of warm weather and vice versa, it is dangerous to assume that individual short-term weather patterns are always indicative of climate change. For instance, while increases in the frequency and severity of storms are one anticipated consequence of climate change, a single instance of a severe storm should not be taken as proof of a complex long-term process. Likewise, while it is difficult or impossible to predict weather systems with any accuracy, climate predictions, which involve averages over many years of observed weather data, can be more reliable. Thus, while weather forecasters may make mistakes predicting next week's weather, this does not mean that long-term climate predictions are worthless, as climate scientists work with averages to predict long-term trends, not particular events.

While climate change represents a major and increasing problem for all nations, many poorer or developing countries which are least able to cope with climate change, and have little economic and political clout, may face some of the most serious health consequences, as problems such as droughts and diseases begin to require more and more of their already limited resources. In other words, countries that are least responsible for greenhouse gas emissions may be among the first to suffer crises. Despite the fact that wealthier nations have been responsible for the majority of the world's human-created greenhouse gases, their greater economic and political autonomy may afford them a greater period of time in which to attempt to meet the challenge of a changing climate. Still, the anticipated consequences of climate change have the potential over the long term to cause a significant reduction in autonomy worldwide on both the state and individual levels.

Work Cited: **IPCC (Intergovernmental Panel on Climate Change)**. 2001. *Climate change 2001: The scientific basis*. Cambridge: Cambridge University Press. (accessed 2 March 2006)

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original is available at http://www.globalautonomy.ca/global1/glossary_entry.jsp?id=CO.0054.