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*The United Nations Climate Change Conference: Copenhagen, December 07-18, 2009.*

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Climate change refers to changes in the concentration of the greenhouse gases (water vapour, carbon dioxide, methane, nitrous oxide, and chlorofluorocarbons), which trap infrared radiation from the Earth's surface, heating it, much like a normal greenhouse. This is called the greenhouse effect. This effect is a natural phenomenon, which helps maintain a stable temperature and climate on the Earth, essential for life. However, this balance is precarious. An increase in infrared radiation captured by the atmosphere has caused changes in the air temperature, precipitation patterns, sea-level rise, and melting of glaciers.

How is it caused?

A change in the global climate is caused by the greenhouse effect. The concentration of these gases is increasing, mainly due to human activities, such as the combustion of fossil fuels (which release carbon dioxide) and deforestation (because forests remove carbon from the atmosphere). The atmospheric concentration of carbon-dioxide, the main greenhouse gas, has increased by 30 per cent since pre-industrial times. There are natural forces at work that are heating the Earth's surface, as well. Solar radiation, deviations in the Earth's orbit and volcanic activity are some natural processes that can raise the Earth's temperature.

What are some of the possible consequences?

Projections of the effect of global warming and the direction climate change will take are derived from the global climate model or the general circulation model (GCM) experiments. Climatologists of the Intergovernmental Panel on Climate Change (IPCC) review the results of these experiments for global and regional assessments.

One study estimated that the global mean surface temperature will rise by 1.5°C to 3.5°C by 2100. This is a significant increase, and would have a major impact on the climate of almost all the regions on Earth. There is likely to be a major change in rainfall patterns in the tropics. A study found that climate change can affect the frequency and intensity of weather events, such as storms and floods, around the world. The melting of the mountain and polar ice caps will lead to the raising of global sea levels. The global mean sea level is anticipated to rise by 15 cm to 95 cm by 2100. This, in turn, will increase vulnerability to coastal flooding and storm surges. The faster the climate change, the greater will be the risk of damage to the environment. Climatic zones (and thus ecosystems and agricultural zones) could shift toward the poles by 150 to 550 kilometres by 2100. These are but some of the projections of the effect of climate change on the world in the next century.

What is the IPCC?

The Intergovernmental Panel on Climate Change (IPCC) is a scientific inter-governmental body that is meant to evaluate the risk of climate change caused by human activity. The panel was established in 1988 by the two United Nations organisations, the World Meteorological Organisation (WMO) and

the United Nations Environment Programme (UNEP). The IPCC does not carry out its own research, nor does it do the work of monitoring climate or related phenomena itself. It, however, published special reports on climate change, its effects, what can be done about it, and the like. The IPCC bases its assessment mainly on peer reviewed and published scientific literature.

What is the Kyoto Protocol? What is expected at Copenhagen?

The Kyoto Protocol is a code to the United Nations Framework Convention on Climate Change (UNFCCC or FCCC), aimed at combating global warming. It was adopted on December 11, 1997 in Kyoto, Japan, and put into force on February 16, 2005. As of November 2009, 187 states have signed and ratified the protocol. The most notable non-member of the protocol is the US, which was responsible for 36.1 per cent of the 1990 emission levels.

Under the Protocol, 37 industrialised countries commit themselves to a reduction of four greenhouse gases (carbon dioxide, methane, nitrous oxide, sulphur hexafluoride) and two groups of gases (hydrofluorocarbons and perfluorocarbons) produced by them, and all member countries give general commitments. Annex I countries agreed to reduce their collective greenhouse gas emissions by 5.2 per cent from the 1990 level. The United Nations Climate Change Conference will take place at the Bella Center in Copenhagen, Denmark, between December 7 and December 18, 2009.

What is carbon sequestration?

Carbon sequestration is a technique used to combat global warming by storing carbon dioxide and other forms of carbon on a long term basis. This method has been proposed to mitigate the effect of greenhouse gases released with the burning of fossil fuels.

What is carbon emission trading?

This is a form of emissions trading specifically and currently makes up the bulk of emissions trading. It is one of the ways countries can meet their obligations under the Kyoto Protocol to reduce carbon emissions and thereby mitigate global warming.

Personal carbon trading is a proposed emission trading scheme under which emissions credits are allocated to adult citizens, within national carbon budgets. These citizens then surrender these credits when buying fuel or electricity. Individuals wanting or needing to emit at a level above that permitted by their initial allocation would be able to engage in emissions trading and purchase additional credits. The converse can be true for those who use less than they are allotted.

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