

Introductory online course on Environment and Development

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Topic: Climate Change

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Climate Change – Global Warming

- Climate change is a change in the Earth's global climate or in regional climate over a time period that ranges from decades to centuries.
- Climate change is any long term significant change in the 'average weather' that a given region experiences. It involves changes in the variability or average state of the atmosphere over durations ranging from decades to millions of years. (Wikipedia)
- It is caused by both natural and human factors. Some natural factors are continental drift, volcanoes, solar variation, orbital variation, ocean currents, comets and meteorites.
- **The term global warming is a specific example of climate change**, which can also include 'global cooling'. Global warming refers to the increase in the Earth's average surface temperature due to a build up of green house gases in the atmosphere. The earth's atmosphere is a thin blanket of gases, which functions like glass in a green house, allowing sunlight to reach the earth and then trapping the heat reflected from the surface of the earth, so it does not immediately escape into space. This is called the greenhouse effect. These gases that make up our atmosphere are called 'greenhouse gases'. They include carbon dioxide, water vapour and methane. Without these gases the average global temperature would be a cold -18 degrees Celsius rather than the present 15 degrees Celsius. Because of human activity these gases are building up to relatively high levels in the atmosphere, increasing beyond the natural warming that makes life on earth possible.
- Many scientists believe that carbon dioxide is the most important gas responsible for enhancing the green house effect. Carbon dioxide is released into the atmosphere through the burning of fossil fuels (coal, oil and natural gas) by power plants, cars and factories. It is also released by land use change such as deforestation. Over the past three centuries the concentration of carbon dioxide has increased in the Earth's atmosphere. From 1700's it has increased from 280 parts per million to 380 parts per million in 2005. Studies have also found a connection where carbon dioxide increases mean global temperatures increase as well.
- In 1988, the United Nations Intergovernmental Panel on Climate Change (IPCC), was set up to assess the scientific evidence for and against climate change. In their first report issued in 1990, they concluded that the warming recorded over the past century, especially in recent decades "...is unlikely to be entirely natural in origin ... the balance of evidence suggests that there is a discernable human influence on global climate". In

2001 they issued an update which stated with greater certainty that warming is happening and is largely caused by human activity. Their report reported:

1. An increase in average global surface temperature of between 1.4 degrees Celsius and 5.8 degrees Celsius (2.5 to 10.41 degrees Fahrenheit) over the period of 1990 to 2100.
 2. A rise in sea levels of between 10.2 cm and 88.9 cm (4 to 35 inches) by the end of this century, or app. 5.1 mm (0.2 inches) per year over the next 100 years.
- Although it is true that climate records only go back to 1910 (IPCC), scientists have other ways of assessing temperature and concentrations of certain gases in the atmosphere. These include:
 1. The study of ice cores taken deep in polar ice
 2. Sediments in oceans and lakes, stalagmites, corals and fossilized trees and pollen
 - These studies show that:
 - Global temperatures are rising faster than at any other time in the past thousand years
 - The level of carbon dioxide, the main gas causing global warming, is now higher than it has been for thousands of years.

Evidence

- Retreating of glaciers:
- Reduction of arctic sea ice:
- Extreme weather events
- Early Spring/late autumn:
- Rising sea levels:
- Migration of tropical pests: Heat Waves:
- Coral reef bleaching:
- Extinction of plants and animals

Weblinks for you to check...

http://unfccc.int/essential_background/feeling_the_heat/items/2904txt.php

http://www.ecobridge.org/content/g_evd.htm

http://en.wikipedia.org/wiki/Climate_change

<http://www.pewclimate.org/hurricanes.cfm>

<http://www.cbc.ca/world/story/2007/11/17/climate-change.html>

