

CLIMATE CHANGE

The crisis of the 21st century

BY: SYED DANISH KABIRAHMAD
GRADE-9, MIDDLE EAST INT'L SCHOOL

Introduction

The term "global warming" is a specific example of the broader term climate change, which can also refer to global cooling. In common usage, the term refers to recent warming and implies a human influence. The United Nations Framework Convention on Climate Change (UNFCCC) uses the term "climate change" for human-caused change, and "climate variability" for other changes. However the term "anthropogenic global warming" is sometimes used when focusing on human-induced changes.

Causes

The Earth's climate changes in response to external forcing, including variations in its orbit around the sun (orbital forcing), volcanic eruptions and atmospheric greenhouse gas concentrations. The detailed causes of the recent warming remain an active field of research. Although it could be argued due to increasing levels of greenhouse gas emissions that it is the main cause of global warming. None of the effects of forcing are instantaneous. The thermal inertia of the Earth's oceans and slow responses of other indirect effects mean that the Earth's current climate is not in equilibrium with the forcing imposed. Climate commitment studies indicate that even if greenhouse gases were stabilized at 2000 levels, a further warming of about 0.5 °C (0.9 °F) would still occur.

Greenhouse Effect

The greenhouse effect was discovered by Joseph Fourier in 1824 and was first investigated quantitatively by Svante Arrhenius in 1896. It is the process by which absorption and emission of infrared radiation by atmospheric gases warm a planet's atmosphere and surface.

Existence of the greenhouse effect as such is not disputed. Naturally occurring greenhouse gases have a mean warming effect of about 33 °C (59 °F), without which Earth would be uninhabitable. Rather, the issue is how the strength of the greenhouse effect is changed when human activity increases the atmospheric concentrations of some greenhouse gases.

On Earth, the major greenhouse gases are water vapor, which causes about 36–70% of the greenhouse effect (not including clouds); carbon dioxide (CO₂), which causes 9–26%; methane (CH₄), which causes 4–9%; and ozone, which causes 3–7%. Some other naturally occurring gases contribute very small fractions of the greenhouse effect; one of these, nitrous oxide (N₂O), is increasing in concentration owing to human activity such as agriculture. The atmospheric concentrations of CO₂ and CH₄ have increased by 31% and 149% respectively above pre-industrial levels since 1750. Molecule for molecule, methane is a more effective greenhouse gas than carbon dioxide, but its concentration is much smaller so that its total radiative forcing is only about a fourth of that from carbon dioxide. These levels are considerably higher than at any time during the last 650,000 years, the period for which reliable data has been extracted from ice cores. From less direct geological evidence it is believed that CO₂ values this high were last attained 20 million years ago. Fossil fuel burning has produced about three-quarters of the increase in CO₂ from human activity over the past 20 years. Most of the rest is due to land-use change, in particular deforestation.

The present atmospheric concentration of CO₂ is about 383 parts per million (ppm) by volume.^[22] Future CO₂ levels are expected to rise due to ongoing burning of fossil fuels and land-use change. The rate of rise will depend on uncertain economic, sociological, technological, and natural developments, but may be ultimately limited by the availability of fossil fuels. The IPCC Special Report on Emissions Scenarios gives a wide range of future CO₂ scenarios, ranging from 541 to 970 ppm by the year 2100. Fossil fuel reserves are sufficient to reach this level and continue emissions past 2100, if coal, tar sands or methane clathrates are extensively used. However all is not lost, there are still small and simple measures that can be taken to eradicate this issue and save earth and its people.

Firstly the residents of different communities should be advised to choose reusable products and should be told to not use disposables. Secondly they must be advised to purchase products with minimal packaging and also to recycle plastic, paper and other refuse as often as possible and if a recycling plant is not present in the area that they live in they should to it that it should be built.

They must also insulate walls and install weather stripping and hence this will aid in the less wastage of energy as heat. They must also to it that they buy energy efficient products and use less hot water. The most important and convenient way to reduce global warming is to plant a tree.

If all these measures are taken earth and mankind can at least slow down the inevitable.