



Global Climate Change: Causes, Effects and Remedies

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ABSTRACT

Climate change is a serious global threat, and it demands an urgent global response. It is caused in large part by human activity, and it will have many serious and potentially damaging effects in the decades ahead. Climate change is a serious concern, drawing increasing attention from the media, policy makers and citizens around the world. Climate change is affecting the basic elements of life for people around the world –access to water, food production, health, and the environment. Hundreds of millions of people could suffer hunger, water shortages and coastal flooding as the world warms. It is important to do something about it to help decrease the amount of change that occurs and make it not happen so fast.

KEYWORDS

Introduction

Climate Change is a complex phenomenon. Consequently, it is also a difficult concept to define. A general definition of this topic is a short-term or long-term alteration of the statistical properties of a climate system. Such a change can be temporary or permanent. It can occur regionally or globally. However, in recent times the main focus is on human activity that is responsible for climate change. Thus the United Nations Framework Convention on Climate Change defines this subject as "a change of climate which is attributed directly or indirectly to human activity that alters the composition of the global atmosphere and which is in addition to natural climate variability Observed over comparable time periods." Climate change is real, and it is really something serious that people downplay a whole lot.

Climate change refers to a statistically significant variation in either the mean state of the climate or in its variability, persisting for an extended period (typically decades or longer). Climate change may be due to natural internal processes or external forcing or to persistent anthropogenic changes in the composition of the atmosphere or in land use. There are many different problems that are leading to our climate change, some of them having to do with the Greenhouse Effect, and other changes are occurring due to human activity and solar irradiance. The earth is becoming hotter, whether we want to admit it or not. Here is what is happening.

Causes of Climate Change

Human economic activity is causing the release of certain pollutants (atmospheric trace gases-mainly carbon dioxide, methane, nitrous oxide and CFSs) which tend to block the emission of heat from the earth surface. These gases are transparent to short-wave radiation from the sun, but absorb long-wave radiation from the earth, thus tapping heat. In theory, increasing their concentration in the atmosphere causes the earth to warm-like green house.

The Greenhouse Effect

An overwhelming body of scientific evidence indicates that the Earth's climate is rapidly changing, predominantly as a result of increases in greenhouse gases caused by human activities. The warming of our atmosphere is actually happening because the atmosphere is continuing to trap the heat that radiates from the earth and traps it between earth and space.

Ocean Currents

Variations in ocean currents can also influence climate change for short periods of time. Ocean currents move vast amounts of heat across the planet. Movement of cold water deep under the oceans towards the regions near the equator and movement of warm water near the equator back towards the pole play an important role in determining the atmospheric concentration of Co₂.

Solar Radiations

The sun is the ultimate source of supply of energy for earth's climate system. A small change in the output of sun's energy can influence the climate change. These changes include changes within the sun and changes in Earth's orbit. Studies suggests that solar variations have played a role in past climate change. For example, period between approximately 1650 and 1850 is known as "Little Ice Age" which may have been partially caused by a low solar activity.

Earth Orbital Changes

A slight change in the tilt of the earth can lead to climatic changes. While less tilt means cooler summers and milder winters; more tilt means warmer summers and colder winters. These small and slow changes can lead to important changes in the strength of the seasons over tens of thousands of years.

Effects of Climate Change

Most of the consequences of Climate Change would result from one of three physical changes in rainfall; sea level rise, higher local temperatures, or changes in rainfall patterns. Climate change can really have a lot of negative consequences. It is already having impact on the plant and animal life, and if you really don't want to see it get much worse- it is time to go green.

Effect on Fresh Water System

Water is an essential resource for all life and a requirement for good health and sanitation. It is a critical input for almost all production and essential for sustainable growth and poverty reduction. The location of water around the world is a critical determinant of livelihoods. Differences in water availability between regions will become increasingly pronounced.

Effect on Agriculture

Food production is particularly sensitive to climate change, because crop yields depend in large part on prevailing climate conditions (temperature and rainfall patterns). Maize-based agriculture in tropical regions, such as parts of Africa and Central America, is likely to suffer substantial declines, because maize has a different physiology to most crops and is less responsive to the direct effects of rising carbon dioxide.

Depletion of Arctic Ice

Though greenhouse effect is necessary for all of us to survive on this planet but an increase in greenhouse gases causes temperature to rise which can result in harmful effects to the ecology and environment. The increase in temperature of atmosphere has resulted in shrinking of arctic ice.

Wildfires

The hot and dry conditions causes wildfires to spread across dense forests and makes it a perfect recipe for disaster. They not only

reduce green cover but also push forest animals towards higher altitudes. Animals that could not survive become extinct and get their name registered in the list of endangered species.

Effects on Energy Supply and Demand

Climate change has wide ranging impacts on society and infrastructure that supports civilization. Global warming could impact not only on agriculture but also on human settlement, energy use, transportation, industry, environmental quality and other aspects of infrastructure that affect our quality of life (IPCC 1990).

Effects on Human Health

One of the most dangerous impacts of changing climate is the way it will affect human health. Extreme heat can kill humans, but also virtually every aspect of predicted climate change has implication for human health. Changes in temperature and precipitation, sea level, fisheries, agriculture, natural ecosystems, and air quality will all directly or indirectly affect human morbidity or mortality.

Effects on Ecosystem

Climate change holds the potential of inflicting severe damage on the ecosystems that support all life, from hazards to coral reefs due to warmer and more acidic ocean waters to threats to polar bears because of declines in sea ice. Ecosystems around the world already are reacting to a warming world. For example, one study found that 130 species, including both plants and animals, have responded to earlier spring warming over the last 30 years.

Heat Waves

The large amount of greenhouse gases released from industries, vehicles, agricultural activities increases the concentration of CO₂ and heats up the atmosphere. The increased temperature then causes heat waves and makes it difficult for people to survive.

Loss of Wildlife Species

Wildfires, deforestation, shifting habitat have caused several species to become extinct, pushed few of them towards extinction and rest of them have migrated to some other place. If experts are to be believed, one-fourth of Earth's species could be extinct by 2050.

Rise in Sea Level

Some parts of the earth are going to naturally be warmer than others, but as the climate changes that means that so will these areas. Warmer conditions may also lead to other areas not getting enough precipitation, and even some areas that may get more than they should. It will also cause parts of glaciers to melt, which could lead to flooding in certain areas and could make the sea levels rise.

Shifting Habitat

Prolonged heat waves, deforestation, wildfires, high temperatures have pushed plants and animals towards higher altitudes. The worst part is that most of them are not able to survive due to changing climatic conditions and have moved more towards extinction.

Remedies

Climate change can really be a negative force on our planet earth. It is time to take a look at the things that can be done to help improve the environment and help to slow down the process of climate change. If we can do that, then the world will be able to be sustainable for much longer. That doesn't mean that climate change is completely avoidable though. The greenhouse gas (GHG) emissions that are causing global warming come from a wide range of sources, including cars and trucks, power plants, farms, and more. Because there are so many sources of these gases, there are also many options for reducing emissions.

- If we could reduce CO₂ emissions at the source, we could eliminate much of the greenhouse warming potential, but this is easier said than done. This might be due to environmental and safety concerns like acidifications of the seawater when the CO₂ is dissolved.

- Technologies are available today to produce electric power and heat more efficiently using both fossil fuels and renewable energy. Power plants using the Integrated Gasification and Combined Cycle (IGCC) process, for example, deliver efficiency gains along with reductions in air pollution by converting coal into a cleaner-burning gas.
- Renewable energy harnesses the power of the wind, the sun, water, tides and other forces to produce electric power. Agricultural "biomass" products also can be used to generate electricity and heat when combusted with coal. Renewables offer the potential to generate electricity without producing greenhouse gases—or producing very little when compared to traditional energy sources.
- Many actions can be taken that would greatly reduce GHG emissions and/or reduce the impacts of greenhouse warming. To avoid the worst effects, scientists say we will need to stabilize greenhouse gas concentrations in the atmosphere; that means reducing emissions of these gases by about 50 to 80 percent. It is a major challenge that will require unprecedented cooperation and participation across the globe. These actions can be taken globally, nationally and individually.
- Individual countries can choose from a large set of possible policy instruments to limit domestic GHG emissions. These include traditional regulatory mechanisms such as technology mandates and performance standards. They also include "market-based" instruments such as carbon taxes, energy taxes, tradable emissions permits, and subsidies to clean technologies. They also include various voluntary agreements between industries and regulators. Climate change affects the basic elements of life for people around the world—access to water, food production, health, and the environment.
- The impacts of climate change or rather the damage would be more on poor countries as they do not have enough resources to mitigate or adapt to climate change. If actions are not taken soon to reduce the impacts of human-induced climate change, the consequences could be far reaching.

REFERENCES

1. Hadley Centre (2005): 'Stabilizing climate to avoid dangerous climate change – a summary of relevant research at the Hadley Centre', available from
2. Hardy John T. (2003) Climate Change: Causes, Effects, and Solutions Published by John Wiley Ltd, the Atrium Southern Gate, Chichester, West Sussex PO19 8SQ, England
3. Hassan, Zubair (2006) Introduction to Microeconomics :An Islamic Perspective Published by Prentice Hall Pearson Malaysia Sdn.Bhd, Lot 2, Jalan 215, off Jalan Templer, Selangor, Malaysia.
4. Smith Klein and Huq (2003) Editors Climate Change, Adaptive Capacity and Development published by Imperial College Press, 57 Shelton Street Covent Garden, London.