

Present Climate Change: A Looming Catastrophe

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Abstract: The Earth's climate is influenced by many factors, including solar radiation, wind and ocean currents. The climate system is controlled by the interaction of the atmosphere, the oceans, the land surfaces, the cryosphere and the biosphere, averaged over time-scales of weeks to centuries and millennia. Climate can be classified into spatial zones based on, for example, regional similarities in temperature and precipitation. These zones often contain similar biotic elements from region to region.

Present human-induced changes/variability in climate show a very disturbing trend. Climate variability affects virtually all natural systems and human activities. Direct impacts of climate include such vital areas as agriculture, air, water quantity and quality, ecosystems and human health. Understanding and potentially predicting, climate changes is, therefore, critical to the public and decision-makers in the government, industry, resources management and hazard mitigation.

The human impact on climate has greatly increased over the past hundred years. We release vast amounts of climate-relevant gases into the atmosphere. This changes the radiation balance of the atmosphere and leads to global warming. In addition to carbon dioxide, these gases include methane, nitrous oxide, halogenated fluorocarbons, per fluorinated hydrocarbons, and sulphur hexafluoride.

Carbon dioxide (CO₂) is released primarily through the burning of fossil fuels (oil, natural gas, and coal) in power plants, vehicle engines or in household heating systems. Its atmospheric levels have risen to almost 390 parts per million (ppm) today as compared to the pre-industrial value of 280 ppm. With this increase the temperature has also risen during the twentieth century. The Intergovernmental Panel on Climate Change (IPCC) states that warming will occur most rapidly in the Arctic.

Under these circumstances, men's willingness to cooperate and seek peaceful solutions to the problems of the globe – especially in view of and in response to, the new challenges arising on land, on and beneath the seas due to the human impact on climate. Because of the scale at which resources on land are being depleted, mining in the ocean depths is becoming more attractive and potentially lucrative. Humans are destroying the land, air and marine environment not only through pollution but also through greed. Over-Population + GREED + lavish lifestyles of men has resulted in a highly destructive climate everywhere which is irreversible.

It is to be noted that long after the stabilization of carbon dioxide levels, the climate will still further continue to change because of its inertia. Climate models indicate that the near-surface air temperature will rise for at least a hundred years. Sea level will continue to rise for several centuries because seawater expands slowly as a result of the gradual warming of the deep sea and

because the continental ice sheets in the Arctic and Antarctic will probably react very slowly to the warming of the atmosphere and the glaciers will continue to melt for many millennia. It will therefore be a long time before sea level achieves a new equilibrium.

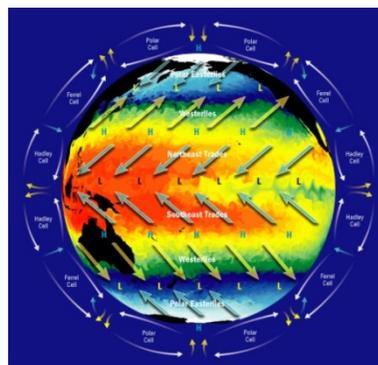
But scientists also believe it is possible that, if the warming is strong, the Greenland ice sheet could completely melt within this millennium and disappear into the ocean. In an extreme scenario, sea level could rise by more than a metre per century, regionally it may be even more. Under pressure from climate change, water problems, food crisis, energy problems, species extinction, overfishing problems will aggravate. The laws of the land and sea face numerous challenges. There is ongoing tension between the life and freedom of the other species and men.

Therefore, after identification of causes and processes of climate change, climatic hazards over short-term (e.g. untimely flooding, drought) and long-term (e.g. ozone hole) should be controlled, mitigated carefully and on a planned, continuous basis.

We need to improve and protect the environment very carefully through utmost understanding and responsibility. The Earth needs an international, thorough and long-lasting approach to solve its climate change problems.

1. INTRODUCTION

The human impact on climate has greatly increased over the past hundred years. We release vast amounts of climate-relevant gases into the atmosphere. This changes the radiation balance of the atmosphere and leads to global warming. In addition to carbon dioxide, these gases include methane, nitrous oxide, halogenated fluorocarbons, per fluorinated hydrocarbons, and sulphur hexafluoride.



Large-scale Circulations in the Earth's Atmosphere

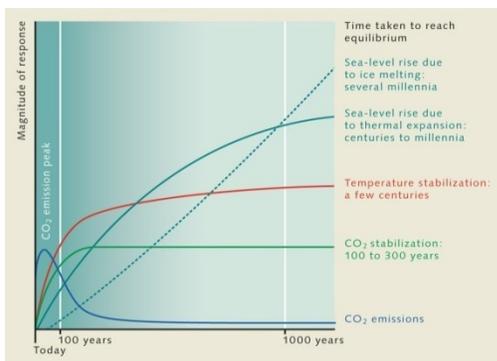
But carbon dioxide (CO₂) is especially important for the Earth's climate system because the worldwide output is so enormous. It is released primarily through the burning of fossil fuels (oil, natural gas, and coal) in power plants, vehicle engines or in household heating systems. Its atmospheric levels have risen to almost 390 parts per million (ppm) today as compared to the pre-industrial value of 280 ppm.

With this increase the temperature has also risen during the twentieth century. That is pressing the climate to change. Humans are destroying the land, air and marine environment not only through pollution but also through greed. Over-Population + GREED + lavish lifestyles of men has resulted in a highly destructive climate everywhere which is irreversible.

2. IMPACT & IMPLICATIONS :

Under pressure from climate change, species extinction, overfishing, maritime navigation, the law of the sea and the whole mankind faces numerous challenges. There is ongoing tension between the freedom of the seas and their territorialization. The prerequisite, however, is states' willingness to cooperate and seek peaceful solutions to any disputes that may arise – especially in view of, and in response to, the new challenges arising on land, on and beneath the seas. The stabilization of carbon dioxide levels needs to be top priority.

Long after the stabilization of carbon dioxide levels, the climate will still further continue to change because of its inertia. Climate models indicate that the near-surface air temperature will rise for at least a hundred years. Sea level will continue to rise for several centuries because seawater expands slowly as a result of the gradual warming of the deep sea and because the continental ice sheets in the Arctic and Antarctic will probably react very slowly to the warming of the atmosphere and the glaciers will continue to melt for many millennia.



It will therefore be a long time before sea level achieves a new equilibrium. But scientists also believe it is possible that, if the warming is strong, the Greenland ice sheet could completely melt within this millennium and disappear into the ocean. The

ice sheet could actually break apart and giant pieces fall into the sea.

The enormous amounts of fresh water could cause a critical change in ocean circulation, for example, in the Gulf Stream. In an extreme scenario, sea level could rise by more than a metre per century, regionally by even more.

The inertia of the climate system and the danger that the trend is irreversible should be sufficient reasons for forward-looking action. One should always keep in mind that the impacts of climate change that are measurable today do not yet reflect the total extent of climate change already caused by humans in the past. Humankind will only begin to feel them sharply in a few decades but has to take action right away.

Overexploited stocks, unemployed farmers / fishermen, short-sighted structural policy – it is impossible to ignore that farm / fisheries management has failed in many respects. Nonetheless, we can all learn from the positive approaches being taken in some regions. These aim to conserve plant / fish species and ecosystems and take account of the social dimension. Because of the scale at which resources on land are being depleted, mining in the ocean depths is becoming more intense. It will further worsen the situation.

Humans are destroying the land, air and marine environment not only through pollution, but also through greed. Global climate change has caused a gradual rise in the Earth's average temperatures.

In the coming years the rate of glacial melting will probably accelerate. Sea-level rise will become more rapid. Scientists anticipate that if greenhouse gas emissions continue unchecked, the sea level could rise by as much as 5 metres by the year 2300. That will be a catastrophe for the only living planet and its inhabitants.

3. SOLUTION :

Every individual living on this planet is responsible for global warming in one way or another and must amend ways to stop this phenomenon in his/her own way. United Nations Framework Convention on Climate Change (UNFCCC) is a common framework in which Kyoto protocol is proposed to fight global warming.

187 countries signed the protocol till November 2009. Kyoto protocol was introduced in 1997 but was enforced from February 2005. The main objective of the protocol was to reduce greenhouse gas emissions by 5.2% by 2012 from 1990 levels. Another solution for climate aims to reduce carbon emissions by 40% by 2020.

To avoid the climate change catastrophe, there are several things we can do to solve the problem of Climate Change. One

solution is to stop producing CO₂. We can do this by switching from oil, coal and gas to renewable energy. Another solution is to plant more trees.

Trees absorb carbon dioxide and produce oxygen, which is not a greenhouse gas. A third solution is to use less energy and to recycle more products. Generating electricity is one of the main sources of carbon dioxide. If we use less electricity, we will produce less CO₂.

Electricity can be generated from sunlight which can be substituted for non-renewable forms of energy. Photovoltaic cells can be used to convert light to electricity and can be used to charge devices such as calculators or power entire house. Solar thermal power plants are another source of energy where electricity is generated by highly pressurized steam from sunlight using power turbines.

Using wind energy reduces carbon emissions drastically, given our major objective is to reduce carbon emissions and maintains eco-balance. Construction of infrastructure required for generating wind energy is not tedious as generally believed.

Efficient use of energy includes proficient car usage, energy reduction power sources, innovated industrial strategies and developing technological solutions. Low noise refrigerators, energy efficient washing machines save significant amount of energy. Hand drying of clothes after machine washing saves considerable energy. Reducing temperatures of air conditioning system also saves huge amounts of energy over the year.

Reducing water usage in daily activities saves good amount of energy. Using public transportation such as trains and buses preserves energy. Suggest rural renewable energy strategies like using hydropower or biogas for lighting and energy purposes instead of candles or kerosene.

Similarly, hydropower or biogas can be used for communications instead of batteries. Solar cookers can be developed and used instead of burning wood for cooking to achieve over 25% efficiency. Solar PV pumps or mechanical

wind pumps can be used to pump water instead of diesel pumps and generators.

Another recommendable solution is saving energy on computers by turning on the save screen mode which reduces power consumption and emissions. It might sound trivial but small amounts of saved energy add up to huge amounts at the end of the year.

4. CONCLUSION

A greater resolve is needed on behalf of all world countries to stand by the promises made to reduce carbon emissions to achieve our objectives by the target, 2020. Countries must work towards the common goal of reducing greenhouse gas emissions and must also abide by frameworks such as Kyoto protocol aimed at reducing global warming.

Also, reducing global warming and addressing climate change is the responsibility of not only governments but also its citizens, of each and everyone. We should collectively work to save energy by reducing unnecessary water usage, saving electricity, using public transport, recycling plastic, bottles, paper and waste.

If we make such small-small changes now in the way we live, we can avoid forced, huge positive changes in the future. Scientists, governments and individuals must work together to overcome this great threat of climate change.

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