

Climate Change : A Threat to Nation

Dr. Manju Sangwan

Asstt. Professor, Govt. P.G. College for Women, Panchkula

ABSTRACT

Climate change is one of the major issues of our life as humans are changing Earth's climate. The effects of climate change are being felt in the atmosphere on all areas of the world. Other climate related changes are like oceans are getting warmed, a strong decline can be seen in Artic sea ice. These changes are affecting our ecosystem as well as human health, global food security, economic development on which our prosperity of a country depends. Scientific information must be spread for societies to make sensible policy decisions. The royal society and the US National Academy of science are ready to support the use of robust science towards these major and critical goals. Many developing countries like India are already making efforts that result in significant reductions in the growth of their greenhouse gas emissions, through policies addressing economic, security or local environmental concerns.

Key words: *climate, ecosystem, , green house, Royal society, UN National Academy*

Introduction

In different regions of earth, climate is different due to the receiving of different amount of sunlight. Over the past few decades, human activities including deforestation and industrialization have accelerated the deterioration of environment, contributing to erratic climate changes. According to the World Health Organization (WHO), the rate of global warming has accelerated by more than 0.18°C per decade in the past 25 years. Around the globe, seasons are shifting, temperatures are climbing and sea levels are rising. And meanwhile, our planet must still supply us – all living things with air, water, food and safe places to live. If we don't act now, climate change will rapidly alter the lands and waters we all depend upon for survival, leaving our children and grandchildren with a very different world. The US Environmental Protection Agency said it would require states to take binding action to reduce carbon emissions from power plants by an average of 30 percent by 2030 from 2005 levels. In this paper I will explain the causes and the dangerous effects of constant weather changes for living beings on earth.

The causes can be divided into two categories- natural causes and man-made causes. The most important thing to communicate about climate change is that there is a 97% consensus amongst the scientific experts and scientific research that humans are causing global warming. We are ignoring the facts that all what is happening around us are just due to our own negligence. We think that our actions are not affecting us personally but it is going to affect us in a large scale gradually . We must know that we are causing global warming. We cause global warming by increasing the greenhouse effect, and our greenhouse gas emissions just keep accelerating.

1st International Conference on Multidisciplinary Research (ICMR-2018)



NIILM University, Kaithal, Haryana, (India)

4th-5th August 2018

www.conferenceworld.in



ISBN:978-93-87793-38-5



Figure 1

1. Human Causes

We contribute a lot to this change in the climate like-

- 1.1 Electricity is the main source of power in urban areas. All our gadgets run on electricity generated mainly from thermal power plants. These thermal power plant run on fossil fuels (mostly coal) and are responsible for the emission of huge amounts of greenhouse gases and other pollutants. The increased amount of gases which absorb heat, has directly lead to more heat being retained in the atmosphere and thus an increase in global average surface temperatures.
- 1.2 Cars, buses, and trucks are the principal ways by which goods and people are transported in most of our cities. These run mainly on petrol or diesel, both fossil fuels.
- 1.3 We contribute a large quantities of waste in the form of plastics that remain in the environment for many years and cause damage.
- 1.4 Huge quantity of paper is used in our work at schools and in offices. We never think that how many trees are cut for our everyday need of paper.
- 1.5 Timber is used in large quantities for construction of houses, which means that large areas of forest have to be cut down.
- 1.6 Also, our population has increased to an incredible extent. More and more land is used for the construction of houses, buildings etc. Vegetation has been cleared to make way for our houses because area available for agriculture is limited, high-yielding varieties of crop are being grown to increase the agricultural output from a given area of land. However, such high-yielding varieties of crops require

large quantities of fertilizers; and more fertilizer means more emissions of nitrous oxide, both from the field into which it is put and the fertilizer industry that makes it. Fertilizers cause pollution also in water bodies.

2. Natural Causes

- 2.1 Millions of years ago, the continents were formed when the landmass began gradually drifting apart. This change also had an impact on the climate because it changed the physical features of the landmass, their position and the position of water bodies. This separation of the landmasses changed the flow of ocean currents and winds, which affected our climate. This drift of the continents is also happening even today; the Himalayan range is rising by about 1 mm (millimetre) every year because the Indian land mass is moving towards the Asian land mass, slowly.
- 2.2 A large volumes of sulphur dioxide (SO_2), water vapour, dust, and ash are exerted into the atmosphere at the time of volcanic eruption. Sulphur dioxide combines with water to form tiny droplets of sulphuric acid. These droplets can stay aloft for several years. They are efficient reflectors of sunlight, and screen the ground from some of the energy that it would ordinarily receive from the sun. Dust particles partially block most of the incoming rays of the sun, leading to cooling. This gives an idea of the ways by which cooling can be brought about for a few years after a major volcanic eruption. Mount Pinatoba, in the Philippine islands erupted in April 1991 emitting thousands of tonnes of gases into the atmosphere. Volcanic eruptions reduce the amount of solar radiation reaching the Earth's surface, lowering temperatures in the lower levels of the atmosphere and changing atmospheric circulation patterns. In the year 1816 known as "the year without a summer." Significant weather-related disruptions occurred in New England and in Western Europe with killing summer frosts in the United States and Canada.
- 2.3 Heat is escaped from the oceans in the form of water vapour, the most abundant greenhouse gas on Earth but through channels as oceans are surrounded by land masses . Yet, water vapour helps in the formation of clouds, which shade the surface and give a cooling effect. This phenomena can have an impact on the climate and is believed to have happened at the end of the last Ice Age, about 14,000 years ago.
- 2.4 The earth makes one full orbit around the sun each year. It is tilted at an angle of 23.5° to the perpendicular plane of its orbital path. For one half of the year when it is summer, the northern hemisphere tilts towards the sun. In the other half when it is winter, the earth is tilted away from the sun. If there was no tilt we would not have experienced seasons. Changes in the tilt of the earth also affect the change of the seasons - more tilt means warmer summers and colder winters; less tilt means cooler summers and milder winters.

2.5 Distance between the earth and the Sun varies over the course of a year as Earth's orbit is elliptical. We think of the earth's axis as being fixed, as always seems to point towards the Pole Star and the North Star. Actually, it is not constant: it moves, at the rate of a little more than a half-degree each century. This gradual change in the direction of the earth's axis is responsible for changes in the climate.

These natural causes for climate change are not in the hands of man to be removed in some or the other way but human made causes can be reduced to a some extent so that our climate change become slow and harm us a little only. There may be some more which I am unable to explain due to limitation on words.

3. Effects of climate change

A major report by the UN has warned us that the impacts can be severe and irreversible.

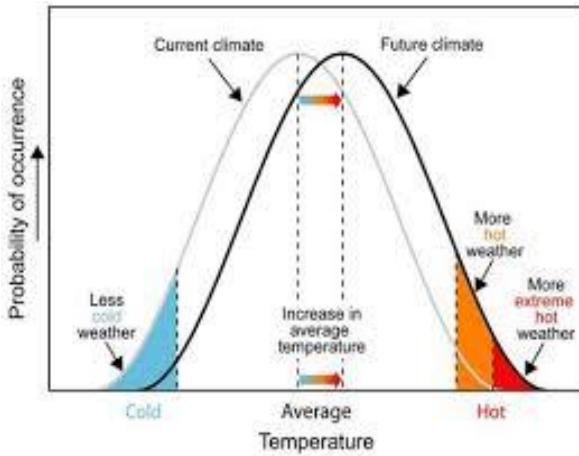
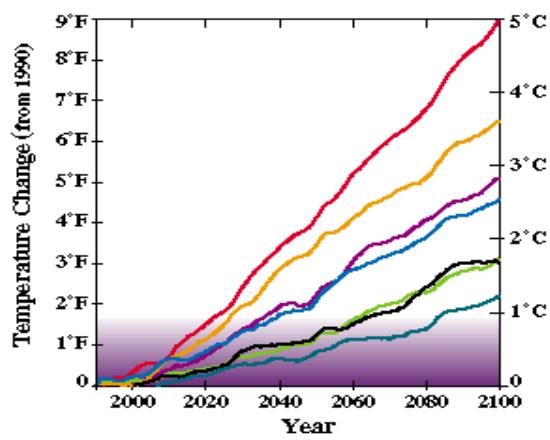


Figure 2

Figure 3

3.1 Emissions of carbon dioxide (CO₂) from our so-called society are turning the oceans more acidic. Ocean acidification has widespread effects in marine species, including the loss of coral communities.

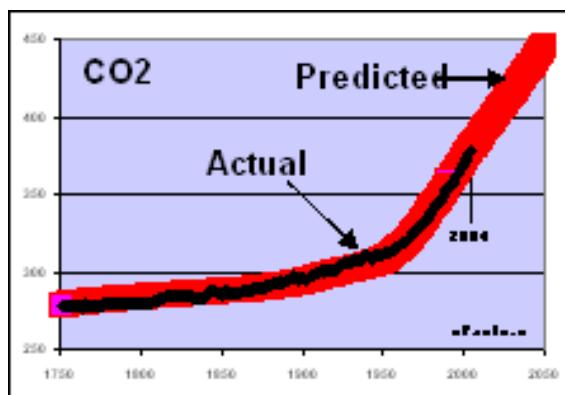


Figure 4

3.2 The glaciers around the world are shrinking and polar ice sheets have started to melt which in results is expanding the world's oceans volume. That's why sea level is increasing. Coastal flooding and coastal erosion due to predicted sea-level rise have bad impacts on human beings or we can say on earth throughout the 21st century and beyond.

3.3 Climate change is happening so fast that many plant and animal species will struggle to survive. Warming of 1.5°C to 2.5°C beyond today's levels would put as many as 20-30% of plant and animal species at increased risk of extinction. That's why species are moving to higher latitudes and altitudes where their chances of survival are better as life cycle of a species is also affected.

3.4 Heavy rainfall, more storms and heat-waves, floods will frequently occur due to change in climate or you can say Global warming . A warmer atmosphere contains more water vapour, which means more rain in storms of many kinds. In Europe, increases in extreme rainfall are projected to further increase coastal and river flood risk. Northern Europe, meanwhile, is getting significantly wetter, and winter floods could become common while Mediterranean area is becoming drier, making it even more vulnerable to drought and wildfires. So we can imagine in future that climate change is expected to cause significant changes in the quality and availability of water resources as the next storm in the western Pacific basin, Tropical Storm Matmo, is now gearing up, and could possibly become a typhoon before hitting Taiwan, though its intensity.

3.5 The increased frequency of both droughts and floods is expected as at higher latitudes crop yields are likely to increase while at lower latitudes, it is likely to fall.

3.6 Extreme weather events pose a direct risk to the health and safety of people, with the very young, the elderly, the disabled and low-income households particularly vulnerable. In near future rise in heat-related deaths due to climatic changes would outweigh deaths due to cold spells in winter in some countries as about 1.2 million deaths per year due to heat-related illnesses mostly in children have been reported worldwide. Flooding in the EU killed more than 2500 people. It affected more than 5.5 million over the period 1980-2011, causing economic losses of more than €90 billion. Sectors that rely

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strongly on certain temperatures and precipitation levels, such as agriculture, forestry, energy and tourism, will be particularly affected by climate change.

3.7 Global warming is going to harm all living things, due to this increase in temperature. It is estimated that, “emissions of greenhouse gases are expected to raise global mean temperatures over the next century to 1.0-3.5%”, (Shavery, Canadel, Chapin, et al., 2000 “Receding glaciers, early blooming trees, bleached corals, acidifying oceans, killer heat waves, and butterflies retreating up mountain sides are likely all ultimately responses to the atmosphere’s growing burden of greenhouse gases”,[2]). Living organism are dying and trying to survive in a warmer world. The study by Intergovernmental Panel on Climate Change (IPCC) consist of scientist worldwide predicted that by 2050, “up to 30% of species would be at increased risk of extinction”, (Kerr, 2007, [3]). Currently, the IPCC findings conclude that: winters in northern Europe will be less sever, arctic permafrost will thaw, the Mediterranean region will dry out, corals will decline, savanna will replace tropical rain forest, rising sea level will increase coastal flooding, mountain glaciers will disappear.

Conclusion

Through this research on factors causing change in global climate, we have come to know that one of the greatest challenges before us at global level is climate change and for that global action in form of concrete commitments is required. Reducing our consumption of fossil fuels (especially oil and gas) will help cut costs in importing these resources and substantially improve the security of energy supply. Similarly, reducing CO2 emissions will help improve air quality, which will produce huge health benefits.

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