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Climate Change: Reasons, consequences and How to Overcome

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" I feel more optimistic about a bright future for man if he spends- Less time proving that he can outwit nature and more time tasting her sweetness and respecting her seniority"

(Elwyn Brooks White)

Climate change is one of the major environmental issue we all are facing today. It is a topic of concern and need immediate attention of the people all over the globe before it reaches to a state from where it is difficult to reverse. Actually we humans are the major culprits, everything which we got from this mother earth, which was the basis of our survival, we have taken for granted. Humans should understand that if we want our survival on this earth, we should work in harmony with the nature, we can't overpower it.

Effect of climate change include prolonged dry spell, global warming, erratic monsoon pattern, ferocious fires, raging storm, floods, rise in sea level etc. It is mainly due to the release of green house gases such as CO_2, CH_4, H_2S and N_2O. These gases in the atmosphere form a blanket which do not allow high wavelength infrared radiations from escaping the earth surface. Hence, have resulted in rise of earth temperature. The sources of these green house gases are the burning of fossil fuels for electricity; heat and transport, deforestation, industries and agricultural lands.Our atmosphere naturally contains greenhouse gases such as CO_2, CH_4 and water vapour that have maintained a mean terrestrial temperature temp around 15^oC. But due to above mentioned human activities this climatic balance have disturbed due to sharp increase in the concentration of these green house gases. The longer a greenhouse gas stays in the atmosphere, the more will be its cumulative heating effect. CO_2 has a very long life time as compared to other green house gases, it stays in the atmosphere

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for several thousand years and after hundred years has developed less than one- fourth of its impact. That's why it is considered as a potent green house gas.

CO_2 in earth atmosphere has increased dramatically over the past 150 years from a concentration of 280 ppm to more than 410 ppm currently. According to a report the earth has already warmed more than 1ºC (1.8ºF) above preindustrial levels. The climate crisis, once talked about in the future tense, has already arrived. If we continue business as usual (by burning the fossil fuels) the science says the world will warm as much as a catastrophic 4.4ºC (8ºF) by the turn of the century.

Causes of Climate Change

Agricultural fields: Agriculture is both a victim and a contributor to climate change. Agriculture in India is directly responsible for 14% of total green house gas emission. Deforestation currently accounts for an additional 18% emission. Large scale changes such as deforestation, soil erosion or machine intensive farming methods may contribute to increased carbon concentration in the atmosphere.

The contribution of farm animals to global green house gas emission is also quite significant. Farming in particular releases significant amount of methane and nitrous oxide, two powerful green house gases. Methane is produced by livestock during digestion due to enteric fermentation and is released via belches. It also escape from stored manure and organic waste in landfills. Other than livestock, paddy fields also favor methane emission due to anaerobic conditions generated because of their continuous flooding. Nitrous oxide emission are an indirect product of organic and mineral nitrogen fertilizers. According to Dr. Rattan Lal (Professor of Soil Science at Ohio State University) 476 billions of tones of C has been emitted from farmland soils over the last 150 years due to inappropriate farming and grazing practices, compared with only 270 Gt (Giga tonnes) emitted from burning of fossil fuels.

The cooling industry is important, but it is also incredibly polluting accounting for around 10% of global CO_2 emission. As the temperature around the world continues to rise due to climate change, the demand for cooling is increasing too. The impact of refrigeration and air conditioning installations on climate change has been principally through energy consumption (produced in general by burning fossil fuels that emits CO_2 into the atmosphere) and the past emission of CFCs. CFCs were the most common type of coolant/ refrigerant

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used in these devices. But after they were found to be depleting the ozone layer they were replaced by new generation fluids such as HFCs and HCFCs. These refrigerants break down ozone molecules far less, but are extremely potent green house gases. Their capacity to warm the atmosphere is thousands of times greater than carbon dioxide. Poorly designed, badly maintained installations or refrigeration units abandoned at the end of their life without recovering or recycling the refrigerant fluid can lead to emissions into the atmosphere. So disposing of old fridges and freezers in the wrong way may have a huge impact on the climate. These emissions are known as the direct effect. The substantial progress made in sealing modern units and in recycling fluids has brought about a considerable reduction in these emissions. The direct impact of refrigerant fluids on climate change is relatively small now and in general is decreasing. Reducing the indirect impact due to energy consumption is the highest priority for the management of refrigeration systems. The reduction of indirect impact of refrigeration and air conditioning units lies essentially in the improvement of their energy use.

Effect of Climate Change on Agriculture

Impact of climate change on Indian Agriculture is studied under National Innovations in Climate Resilient Agriculture (NICRA). Variations in agricultural yield is due to projected increases in temperature, shifts in rainfall patterns and elevated surface CO_2 concentration from human induced green house gas emissions. This year due to sudden heat waves in the month of march when the wheat crop is at its maturity stage, a fall in the wheat yield by an average of 13.5% in Punjab was witnessed. This ultimately resulted in decrease of farmer's income. It is not only the production, but also the quality of grain was affected due to higher content of shriveled grain. It is also associated with increase in sea level and flooding of the coastal areas. Heat waves in extreme conditions due to thermal stress and dehydration causes death of humans and animals. Climate change also resulted in outbreak of disease and pest incidence in crops.

How to Combat Climate Change

India is the 3rd largest emitter of green house gases after China and USA. The effect of climate change is already threatening our health, communities, economy, security and children's future. According to IPCC's (Intergovernmental Panel on Climate Change) report in recent years. we must cut emission of green house gases sharply and immediately to avoid

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the most catastrophic effects of a warming planet. Change only happens when individuals take action. There is no other way, if it doesn't start with the people.

To combat climate change we must drastically cut emission and remove some C from the atmosphere. Fortunately plants naturally absorb and store CO_2. By conserving forests and wetlands, protecting natural habitats and planting trees, we can store billions of tons of this 'living carbon'. A good example for all of us is set by Telangana forest department. They restore an encroached and degraded forest patch, spread across 160 acres in the core area of the Kawal Tiger Reserve to its verdant glory with the help of village persons. Our small small efforts could bring a massive difference in this regard.

To reduce further emission we could restrict the use of electricity, private vehicles, heaters, air conditioners and refrigerators. Beside this agricultural practices on farm should be more eco-friendly. By managing water in irrigated rice fields (by letting the field dry after irrigating rather than keeping rice fields continuously flooded will reduce methane emissions without compromising yield. This technique also requires less energy for water pumping where rice field is irrigated using groundwater), better livestock feed and manure management, efficiently utilizing nitrogen fertilizers, adopting zero tillage practices, stopping rice crop residue burning and reducing farm energy consumption and replacing with green energy we could effectively bring down farming emission of green house gases.There are ways to cool a home without the need for air conditioning. Traditional approaches use water features such as fountains to help cool the air passing through a building, while others use careful design to encourage natural air circulation. Ancient forts and buildings are found to be naturally cool because of the way they are designed. Even simple approaches like placing an earthenware pot of water near a window or drafty spot can help to cool a room by a few of degrees.