Making Sense of Climate Change

1. What is Global Warming?

Life on earth owes its existence to the warm blanket formed by the carbon dioxide, methane, nitrous oxide, hydro fluorocarbons, per fluorocarbons and sulpher hexafluoride etc. known as Greenhouse Gases (GHG) around it that traps a part of the infrared rays reflected from the surface of the earth. But now this protective blanket is becoming thicker due to human induced emissions. This is causing an enhanced greenhouse effect that is warming up the earth.

- Average temperatures have climbed 0.8 degree Celsius around the world since 1880, much of this in recent decades, according to NASA's Goddard Institute for Space Studies. Climate models suggest that the average global earth surface temperature will rise by 1.9 to 4.6 centigrade by the turn of this century. The consequences of this trapping of enormous energy around the surface of the earth are likely to be so severe that it has been termed as the single biggest threat to humankind comparable to the destruction caused by the two World Wars and the Great Depression.

- The rate of warming is increasing. The 20th century's last two decades were the hottest in 400 years and possibly the warmest for several millennia, according to a number of climate studies. And the United Nations' Intergovernmental Panel on Climate Change (IPCC) reports that 11 of the past 12 years are among the dozen warmest since 1850.

2. What is Climate Change?

Climate change is a natural phenomenon and has been occurring since the earth came into being. Over the last 400000 years, the earth's climate has been unstable with well-marked warm and cold periods. However, in the last 150-200 years, it has been observed that the change has been a little too rapid, unlike the natural phase when changes occurred slowly and definitely. In fact, speed at which this change has occurred in the last few decades is causing particular worry to scientists and climatologists. This acceleration has mainly been attributed to interventions by human kind. This human induced climate change is a cause of grave environmental concern because it will have an impact on each and every life form on earth. The change is occurring too rapidly for some species to adjust, thereby leading to their extinction.

3. What causes Climate Change?

The Intergovernmental panel on climate change report (IPCC report Feb2007), based on the work of some 2,500 scientists in more than 130 countries, concluded that humans have caused all or most of the current planetary warming. Human-caused global warming is often called anthropogenic climate change.

- Industrialization, deforestation, and pollution have greatly increased atmospheric concentrations of water vapor, carbon dioxide, methane, and nitrous oxide, all greenhouse gases that help trap heat near Earth's surface.

- Humans are pouring carbon dioxide into the atmosphere much faster than plants and oceans can absorb it.

- These gases persist in the atmosphere for years, meaning that even if such emissions were eliminated today, it would not immediately stop global warming.

4. Effects of Climate Change?

A follow-up report by the IPCC released in April 2007 warned that global warming could lead to large-scale food and water shortages and have catastrophic effects on wildlife. .

- Sea level could rise between 7 and 23 inches (18 to 59 centimeters) by century's end, the IPCC's February *2007* report projects. Rises of just 4 inches *(*10 centimeters) could flood many South Seas islands and swamp large parts of Southeast Asia.

- Some hundred million people live within 3 feet (1 meter) of mean sea level, and much of the world's population is concentrated in vulnerable coastal cities.

- Glaciers around the world could melt, causing sea levels to rise while creating water shortages in regions dependent on runoff for fresh water.

- Strong hurricanes, droughts, heat waves, wildfires, and other natural disasters may become commonplace in many parts of the world. The growth of deserts may also cause food shortages in many places.

- More than a million species face extinction from disappearing habitat, changing ecosystems, and acidifying oceans.

- The ocean's circulation system, known as the ocean conveyor belt, could be permanently altered, causing a mini-ice age in Western Europe and other rapid changes.

- At some point in the future, warming could become uncontrollable by creating a so-called positive feedback effect. Rising temperatures could release additional

greenhouse gases by unlocking methane in permafrost and undersea deposits, freeing carbon trapped in sea ice, and causing increased evaporation of water.

- There could be acute scarcity of water in some parts of the world due to change in weather pattern.

5. Finding Solutions?

From the information gathered through expert studies, it is clear that the problem is serious and there is an urgent need to find solutions. We are aware that we share one atmosphere and that we have only one planet in our solar system where life is possible. Therefore, as citizens of the world, it is our collective duty to preserve it, conserve it, keep it clean, and take care of it.

- A reduction of GHGs can only be achieved by lowering the use of fossil fuels halting deforestation, streamlining agricultural methods, and cutting down consumerism. This is a not a very easy task for nations to achieve; their dependence on fossil fuels for energy and on forest products for various raw materials is very high. Reduction in use of fossil fuels could adversely affect industries and transportation. If undertaken too quickly, it may threaten to even destroy many industries and bring down economic growth.

6. Climate Change in India?

We live in a country that is the seventh largest in the world and the second largest in Asia. It is the second most populous in the world. Having crossed the billion mark in 2000.

- It was at the Stockholm conference (1972) where Mrs. Indira Gandhi stated that development to us is one of the primary means of improving the environment for living, or providing good, water, sanitation and shelter, of making the deserts green and mountains habitable. This served as the beginning of a series of environmental measures in India.

- India accounts for about three per cent of the total CO2 equivalent emission (base year 1990). The energy sector is the largest contributor with about 55% of the total. In the industrial sector, the cement industry accounted for the highest level. Thermal power plants are also major contributors as they mainly use fossil fuels. It is estimated that 34% of the GHGs come from the agricultural sector, mainly rice cultivation, livestock, manure, and burning of agricultural residue and deforestation.

7. Impacts of climate change in India?

In a developing country like India, climate change will exert additional stress on the ecosystems, the economy, and the society. India lies in the tropical zone and with its

extensive coastline; it is more vulnerable to changes in the climate. Its economy is dependent on climate- sensitive sectors such as agriculture and forests. Indian farmers are still very dependent on the weather and any change in the climate will affect their means of livelihood. With change in climate there will also be a change in the pests, insects, and diseases as stated in earlier chapters. Added to this is the increasing population that will put severe pressure on food production and availability.

- India's densely populated low-lying coastline will be badly affected by and sea level rise. According to a 1989 UNEP report, India is among the 27 countries that are most vulnerable to sea-level rise. Coastal areas of Andhra Pradesh, Orissa, and Tamil Nadu are prone to tropical cyclones.

- Added to this is the stress from temperature rise and a predicted movement of the monsoons further north. Heat wave, droughts, floods, and tropical storms along with erratic precipitation have all indirectly affected agricultural production, claimed hundreds of lives, and caused great suffering to a large section of the population.

- Due to change in weather pattern there will be acute scarcity of drinking water in some parts of the country especially the north and north west parts of India.

- The snow and ice mass in the Himalayan range is the third largest in the world, after the Greenland and the Antarctica ice sheets. There has been a noticeable increase in the snow melt and if this continues, it will affect the water supply of much of Asia.

- The most direct effect of climate change would be the hotter temperature themselves. global warming is expected to extend the favorable zone to vectors conveying infections.

8. Plant or Perish?

Natural sinks like forest cover, vegetation, oceans, and soil (to some extent) have the capacity to absorb CO2. In fact, soil may also be a removal mechanism for CH4.

- It is important for countries all over the world to take measures to ensure that the global forest cover is restored to its maximum. Reforestation should be done immediately after felling trees to prevent the soil from being exposed for too long. Many lands all over the world are lying fallow either because they have been abandoned after intensive cultivation or the soil in not rich enough for plants to regenerate. These large areas should be given special attention. Plantation drives should be undertaken with species that would be best suited for the particular soil type and local climate.

Top 10 Reasons Why Trees Are Valuable and Important

Trees are important, valuable and necessary to our very existence. It's not too hard to believe that, without trees we humans would not exist on this beautiful planet. Trees are essential to life as we know it and are the ground troops on an environmental frontline. Our existing forest and the trees we plant work in tandem to make a better world.

1. Trees Produce Oxygen

Let's face it, we could not exist as we do if there were no trees. A mature leafy tree produces as much oxygen in a season as 10 people inhale in a year. What many people don't realize is the forest also acts as a giant filter that cleans the air we breathe.

2. Trees Clean the Soil

The term phytoremediation is a fancy word for the absorption of dangerous chemicals and other pollutants that have entered the soil. Trees can either store harmful pollutants or actually change the pollutant into less harmful forms. Trees filter sewage and farm chemicals, reduce the effects of animal wastes, clean roadside spills and clean water runoff into streams.

3. Trees Control Noise Pollution

Trees muffle urban noise almost as effectively as stone walls. Trees, planted at strategic points in a neighborhood or around your house, can abate major noises from freeways and airports.

4. Trees Slow Storm Water Runoff

Flash flooding can be dramatically reduced by a forest or by planting trees. One Colorado blue spruce, either planted or growing wild, can intercept more than 1000 gallons of water annually when fully grown. Underground water-holding aquifers are recharged with this slowing down of water runoff.

5. Trees Are Carbon Sinks

To produce its food, a tree absorbs and locks away carbon dioxide in the wood, roots and leaves. Carbon dioxide is a global warming suspect. A forest is a carbon storage area or a "sink" that can lock up as much carbon as it produces. This locking-up process "stores" carbon as wood and not as an available “greenhouse" gas.

6. Trees Clean the Air

Trees help cleanse the air by intercepting airborne particles, reducing heat, and absorbing such pollutants as carbon monoxide, sulfur dioxide, and nitrogen dioxide. Trees remove this air pollution by lowering air temperature, through respiration, and by retaining particulates.

7. Trees Shade and Cool

Shade resulting in cooling is what a tree is best known for. Shade from trees reduces the need for air conditioning in summer. In winter, trees break the force of winter winds, lowering heating costs. Studies have shown that parts of cities without cooling shade from trees can literally be "heat islands" with temperatures as much as 12 degrees Fahrenheit higher than surrounding areas.

8. Trees Act as Windbreaks

During windy and cold seasons, trees located on the windward side act as windbreaks. A windbreak can lower home heating bills up to 30% and have a significant effect on reducing snow drifts. A reduction in wind can also reduce the drying effect on soil and vegetation behind the windbreak and help keep precious topsoil in place.

9. Trees Fight Soil Erosion

Erosion control has always started with tree and grass planting projects. Tree roots bind the soil and their leaves break the force of wind and rain on soil. Trees fight soil erosion, conserve rainwater and reduce water runoff and sediment deposit after storms.

10. Trees Increase Aesthetic and Property Values

Real estate values increase when trees beautify a property or neighborhood. Trees can increase the aesthetic and property value of your home and locality.