

Special Article

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Global warming – where we are

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Over last 8000 years, Earth's surface temperature raised by 1° C only. But at the present rate of global warming, the temperature would rise by 2.5°C by 2050. By the end of this century temperature would rise by another 2.5 °C. The Earth which was like an icebox has started burning. The sun sends energy as heat & light. Some part of the rays get through the atmosphere, some of them get reflected back into space. The ones which get through the atmosphere warm the earth up. All the time the earth radiates heat into space. Some of the heat going out is trapped by the atmosphere. This keeps our

planet warm enough to live on. But if too much heat is trapped, the planet will warm up and the climate will change. The atmospheric air around the surface of the earth is made from a mixture of gases. Some of the gases trap heat, called greenhouse gases. This phenomenon is called natural greenhouse effect. Amount of greenhouse gases in the atmosphere is increasing day by day through human activities. More heat is trapped, enhanced greenhouse effect results. This is causing the earth to heat up universally called as – 'Global warming'. It doesn't just mean that the

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earth gets hotter; the whole climate is changing. Nitrogen & Oxygen make up 99% of the atmosphere, don't trap heat, called non-greenhouse gases. Carbon dioxide, Methane, Nitrous oxide,

Ozone, Water vapour – these gases make up 1% of the atmosphere, trap heat, called greenhouse gases. Human activities increases the amount of these gases in the atmosphere

Worldwide Carbon Emissions:

French mathematician, J B Joseph Fourier noticed that temperature of Earth was slowly increasing. He termed it “Greenhouse effect”. In 1850, an instrument became available to record the surface temperature of Earth. 1880s, Scientists associated the relation between human activities and rise of CO₂ level in the atmosphere. In 1995, Scientists formed an association Intergovernmental Panel on Climate Change (IPCC). The IPCC concluded that global warming has been due to building of Green House Gases in the atmosphere. In 1997, Kyoto protocol was introduced; an international agreement setting targets for industrialized countries to cut down their GHG emission. In 2005, Kyoto protocol entered into force. In 2008, WHO selected the timely and relevant theme for World Health Day 2008: “Protecting health from Climate Change”. In 2009, Copenhagen summit was held to ensure that rich nations

reduced their GHG emissions. In 2014, theme of the World Environment Day was ‘Small Islands and Climate Change’ and the slogan was ‘Raise Your Voice Not The Sea Level’. In 2015, United Nations called Climate Change Conference in Paris. In the Paris Climate Deal Governments agreed to ‘pursue efforts’ to limit warming to 1.5 degree Centigrade above pre industrial level. Now it came in notice that developed countries are the worst polluters ; responsible for 55% carbon emission by 15% of the population. Green House Gas emission is likely to double in another 150 yrs. Human activities are mainly responsible for emission of Green House Gases. These includes - Burning of fossil fuels, industrialization, urbanization, deforestation, vehicular traffic, nuclear explosions. The number of hot days per year is on the rise, resulting in increased number of heat related deaths around the world.

Effect of Global Warming:

Extreme weather conditions can bring about many health problems. The young and elderly are particularly vulnerable to extreme weather

Shift in hydrological cycle: Reduction in quality and availability of drinking water, decreased production of food crops, droughts and famines, increased incidence of malnutrition.

Acid rain: SO₂ and NO₂ coming from industries combine with oxygen and moisture of the air and form dilute mixture of sulphuric acid, nitric acid and carbonic acid. Acid rain in turn causes destruction of food crops, deforestation, desertification, erosion of soil and destruction of aquatic life.

Agriculture: Impact on agriculture can affect human health. Large part of the world and its nations depend on agriculture as their main source of income and on food production. The estimated number of starving people

Species Extinction: Over the past 30 years, the dry season in the Costa Rica's cloud forest has become warmer and drier. 20 out of 50 species of frogs

and toads have disappeared from a 30-square-kilometer study area. Extinction of the golden toad registered from the Central and South American tropics.

conditions. Human health can be affected directly or indirectly in a number of ways by global warming. These are:

worldwide is expected to increase by 250-300 million by 2060. Growth of crops depends on many factors - temperature, precipitation, soil fertility. Extreme weather events (droughts, high intensity storms, heat waves, floods etc.) are very damaging to crops. The effects of more gradual affects (e.g., average temperature increase) are difficult to predict.

Plant and Animal Communities:

This effect is difficult to measure, but potentially dramatic. Small changes in climate can cause disruptions in habitat of many species and their food availability. Loss of key predator or prey species affects the life cycles of other organisms in the food chain.

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Biological Shifts: Shift in the ranges of 35 species of non-migratory butterflies occurred. Toucans and other bird species have shifted their range to higher altitudes. Decline in body weight of polar bears, resulting from

Air quality and human health:

Climate change may indirectly affect the concentration of particulate matter in the air. When inhaled, these particles can reach the deepest regions of the lungs. Exposure to particle pollution is linked to a variety of significant health

early melting of sea ice and lowered food availability is seen. Reduction of phytoplankton growth observed in the Ross Sea that could disrupt the Antarctic food chain.

problems: Respiratory diseases (infectious, carcinogenic, allergic) as a result of air pollution, smog formation, visibility impairment, heat waves, heat stress, destruction of historical monuments.

Effect on ecological balance:

- Increased frequency of natural disasters (storms, floods, cyclones etc.)
- Alteration of vector ecology favouring their propagation and transmission of vector borne diseases like malaria, filariasis, dengue etc.
- Both mosquito and tick borne infections are likely to increase
- Many infectious agents, vector organisms, non-human reservoir species are sensitive to climatic conditions
- Salmonella and cholera bacteria proliferate more rapidly at higher temperatures
- Cholera risk will increase in coastal or estuarine regions, due to a warming of water temperatures
- Hotter, more humid weather shortens mosquito breeding cycles
- The incubation of dengue virus is speeded up by increased temperatures
- Destruction of coral reefs : It is projected that the great barrier reef of Australia will be lost in another 50 to 100 years affecting the life of more than 1500 aquatic species which depend on these coral reefs
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Who will be affected first?

Small islands and low-lying coastal areas are at increased risk of flooding due to rapid sea level rise. These areas share risk factors for warming-induced disasters due to small physical size, surrounded by large expanses of ocean, relative isolation, limited natural resources, low economic diversification, limited funds and human resources.

Rising sea levels will cause displacement of coastal communities, disturbance of agricultural activity, coastal erosion, beach loss, decline in tourism, intrusion of sea water into freshwater aquifers which would deplete the general water supply for human, rise in water borne epidemics.

Global warming & our country:

India is a disaster prone country. Global warming here has an effect of increasing in the frequency and intensity of these climatic disasters. In 2007-2008, India ranked third highest in the world regarding number of significant disasters. Global warming may also pose a significant threat to the food security situation in India. A temperature increase of 2° C in India is

projected to displace seven million people, with a submersion of the major cities of India like Mumbai and Chennai. If the process of global warming continues, resulting climatic disasters would cause a decrease in India's GDP to decline by about 9%, with a decrease by 40% of the production of the major crops.

Intervention for Global Warming:

The warning of warming is global with universal Intensity of the danger threatens all of our basic survival mechanisms - food, water, shelter, and health. Now it is high time for action because almost all of the human activities are resulting in carbon emissions. Mitigation and adaptation are two ways we can respond to

climate change. The aim of any action initiated should result in delaying or complete reversal of climate change. Mitigation intervention try to reduce GHG emissions, decrease energy consumption and reduce, reuse, recycle as responsible individuals. Adaptation means getting ready for impact of

climate transformation and emergency

watchfulness

Mitigation and adaptation interventions :

These are -

- Campaign for healthy policies
- Advocate and support laws that reduce GHG emissions
- Maintain sustainable lifestyles
- Encourage greeneries : Plant trees
- Opt for eco-friendly & emission free electric cars
- Reduce use of fossil fuel
- Encourage use of ‘Green Energy’
- Erect solar power plants
- Use solar lantern for rural home lighting
- Encourage community biogas plants
- Explore wind to obtain power supply
- Improve water harvesting system to save water
- Disaster mitigation
- Ban on plastic bags, buy products with reusable or recyclable packaging
- Save rivers from sewage & industrial waste
- Avoid leisurely car drives : take public transport
- Use bicycle, a zero pollution vehicle
- Avoid using papers, so that trees can be saved
- There should be inter-sectoral coordination among Govt. agencies, NGOs, professional groups & local communities to meet the global threat
- Sooner the steps taken, greater will be the impact
- Additional sources of energy must be fully exploited
- Initiate action to increase easy access to cleaner and renewable energy
- Ten per cent increase of installed capacity in renewable energy (Wind, small-hydro and biomass)
- Content of ethanol in petrol to increase up to ten per cent
- Depending upon bio-diesel production and availability, the entire country may be progressively covered with sale of 5% bio-diesel blended diesel.
- EURO IV equivalent norms in identified cities and EURO III equivalent norms in the entire country was introduced in 1 April, 2010.

- Setting up of a National Energy Fund (NEF) for supporting R&D in energy sector
- Encouragement through suitable concessions to be provided for manufacturing of fuel efficient vehicles and for use of alternative fuels for promoting energy conservation and environmental protection.
- National Action Plan on Climate Change (NAPCC) was launched in 2007 to coordinate national action for assessment, adaptation and mitigation of climate change with Prime minister as the chairman.

Conclusion:

Our beautiful planet is in crisis. We need to mobilize all our forces to ward off climate change and to achieve our continued existence on this planet. It is an intense & wide challenge for each of us. It calls for a preventive public health approach : need to strengthen the existing public health system. We must tackle the issue on all fronts. It is a shared international responsibility.

We have to “Think Globally, Act Locally”(World Health Day Theme 1990). We have to perceive the phrase – ‘One planet one family’ to save our beautiful planet. We humans are thought to be the main cause of global warming and climate change but we still have the chance to do something about it.

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