



GLOBAL WARMING

ISSUES AND CHALLENGES

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Global Warming *Impact and Care*

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Global warming is a major environmental problem. It is the process by which the mean global temperature is increased due to increased concentration of chlorofluorocarbons (CFCs) formed mainly from industrial smoke and vehicular emissions. India in the developing process, needs more energy to bring structural changes in the production process. To generate electricity, India has to burn fossil fuels, as 70 per cent of our electricity supply comes from coal. Burning of fossil fuels alone account for 83 per cent of India's carbon-di-oxide emissions which add to GHG's leading to global warming. Since the beginning of the industrial revolution human activities have caused an increase in several GHG's most notably carbon-di-oxide. Another cause is land use changes, such as deforestation. When forest land is destroyed. Carbon-di-oxide is released into the air. It is reported that 25 per cent of all

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carbon-di-oxide release entering the atmosphere is because of cutting and burning of about 34 million acres in a year. If we continue emitting carbon-di-oxide into the atmosphere, it is estimated that by the year 2030, concentration of carbon-di-oxide, will have been doubled from pre industrial revolution.

Impacts of Global Warming

Global warming leads to:

- Rise in temperature.
- Rise in sea level.
- Occurrence of extreme events.

Rise in Temperature

Since warming depends upon the level of GHG's in the atmosphere, continued emission beyond the absorptive capacity of the earth would cause increase in temperature. The National Oceanic and Atmospheric Administration, the climate agency of America reported that the average temperature of Earth for the first four months of the year 2010 of 13.3°C is 0.69°C above the 20th century average. The IPCC projected a warming of about 0.2.°C per decade, if emission of GHGs continues to increase at the present rate. In most cases rise temperature is expected to be 2 to 4 °C. Any increase in atmospheric temperature may increase the water requirement of the crops, reduce the crop duration and reduce the yield. The decline in agricultural productivity in India over the years for selected food grains is shown in Table 19.1.

Table 19.1: Trends in Yields of Foodgrains (kg/ha)

Items	1950-51	2001-02	2007-08
Foodgrains	522	1734	1854
Pulses	441	607	638
Rice	688	2079	2203
Wheat	633	2762	2785
Oilseeds	481	913	1086

Source: Economic Survey, Various Issues.

About 80 per cent of Indian farmers supplement agriculture with livestock for enhancing the income and food for sustainability. The rise in temperature would likely result in decline in dairy production, reduced animal weight gain and reproduction and lower feed conversion efficiency in warm regions.

Rise in Sea Level

The rise in temperature leads to a rise in sea level. The sea level along much of the US coast is already rising at the rate of 2.5 to 3.0 mm per year or about 10-12 inches per century. The IPCC (2007) estimated that the rise in global average sea level during 1961-2003 was about 1.8 mm per year; where as during 1993-2003 it was about 3.1 mm per year. The expected rise in sea level by the end of this century is 0.18-0.38 mm and 0.26-0.59 for the low emission and high emission scenario. The causes of rise are thought to be two fold: the primary cause being the thermal expansion of warm ocean water and the secondary cause being the melting of glacial ice. Mountain glaciers and snow cover have declined on an average in both hemi spheres. The rise in the sea level results in the melting of glaciers. Himalayan glaciers are retreating at the rate of 50 feet or 15 meters per year. This increases flood risk and changes in ocean circulation patterns such as the conveyer belt. This could affect and harm plants and animals that live in the sea. These glaciers feed the major rivers of India such as Indus, Ganga and Brahmaputra. The economic impact of loosing these fresh water resources in India could have severe economic impacts on the people as well as on agriculture. This affects fish population and the aquatic food web as species seek conditions suitable for their life. Higher ocean acidity affects the marine environment through deficiency in calcium carbonate, affecting shelled organisms and coral reefs. Exacerbate flooding and increase in the salinity of rivers bays and ground water arise with rise in the sea level.

Occurrence of Extreme Events

The emerging global warming results in uncertain but significant risks of catastrophic outcomes. Severe heat waves,

hurricanes, droughts and other erratic weather extremes are part of global warming. A World Bank report estimates that environmental degradation costs India around 80 billion dollars a year in terms of public health. R.K. Pachauri, the Chairman of IPCC (2008) reported that:

- Endemic morbidity and mortality due to diarrhea disease is primarily associated with floods and droughts.
- Exacerbation of the abundance and toxicity of cholera is due to increase in coastal water temperature.
- Increased deaths, disease and injury due to heat waves, floods, storms, fires and droughts.

Measures Undertaken to Mitigate Global Warming

- The Ministry of Renewable Energy is promoting sources of renewable energy.
 - solar energy;
 - bio-mass;
 - hydel energy.
- Wind energy and geothermal energy sources are also being explored.
- Cleaner fuel is also being promoted through administrative and legal ways.
- Educational institutions have included 'environmental science' in their curriculum.
- Public awareness has also been created.
- Water conservation and harvest technologies have been promoted.

Suggestions

Humans directly or indirectly cause global warming. Let us not wait for the governments to find a solution for this problem. There are simple things which an individual can do to reduce the global warming phenomena. Follow the 'three R mantra' – Refuse, Reduce and Reuse.

- *Refuse*
- Boycott firecrackers.
- Use paper bags in shopping malls instead of plastics.

- Use water frugally.
- Buy organic food, educate the rural and urban consumers to go for green products.
- *Reuse*
- Use washable plates and utensils.
- Create alternative energy resources by using the existing technology.
- *Reduce*
- Drive vehicles with good mileage.
- If possible walk or take public transport.
- Replace a regular incandescent light bulb with a compact fluorescent light bulb. CFLs use 60 per cent less energy than a regular bulb.
- Do not leave electrical appliances on stand by mode when not in use. Use the 'on/off' function on the machine itself.
- Turn out the light when leaving the room.
- Have trees around the houses.

Universities have to take up research on climate change, carbon trading and green environment. To conclude.

For the Government

- The central and state governments have to go beyond GDP, to measure and manage the cost of climate change, environmental degradation and bio-diversity loss.

For the Corporate

- The corporates have to sign up the 'Carbon Disclosure Project' in India.

For the Individuals

- Before buying anything ask 'How Eco Friendly It Is'?

References

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