Vol. I - No. 2 July - December, 2014

Climate SAR सार

Climate Science And Research

Climate Change Research Institute
Science & Technology Solution for Sustainable Energy Future
C- 85 Shivalik, New Delhi - 110017

STOP
Global Warming

FROM EDITOR

'Global Warming refers to rise in the global average surface temperature'.

'Climate Change is about changes in climate patterns, including temperature, precipitation, winds and others'.

What you can do to stop global warming? Start by reducing your Carbon Footprints. Carbon dioxide emission occurs by all your day-to-day activities that consume energy. There are number of things you can do by reducing your energy needs. You can also share information about it with your friends & family, make global warming quiz with your class mates and also be vigilant about the energy use.

In this issue I tell you about global warming, its causes, effects and taking action to stop it. You learn about greenhouse gases and enhanced greenhouses effect. The global warming can lead to climate change, which in turn causes several adverse impacts. It changes ecosystem, threatens health and crops.

Climate Change Research Institute has started this bulletin on Climate Science and Research- 'Climate *SAR*'. By learning about global warming and understanding it, you are in a better position to look for solutions for yourself.

Happy reading and send your feedback to contactus@ccri.in

Dr. (Mrs.) Malti Goel
CEO, Climate Change Research Institute

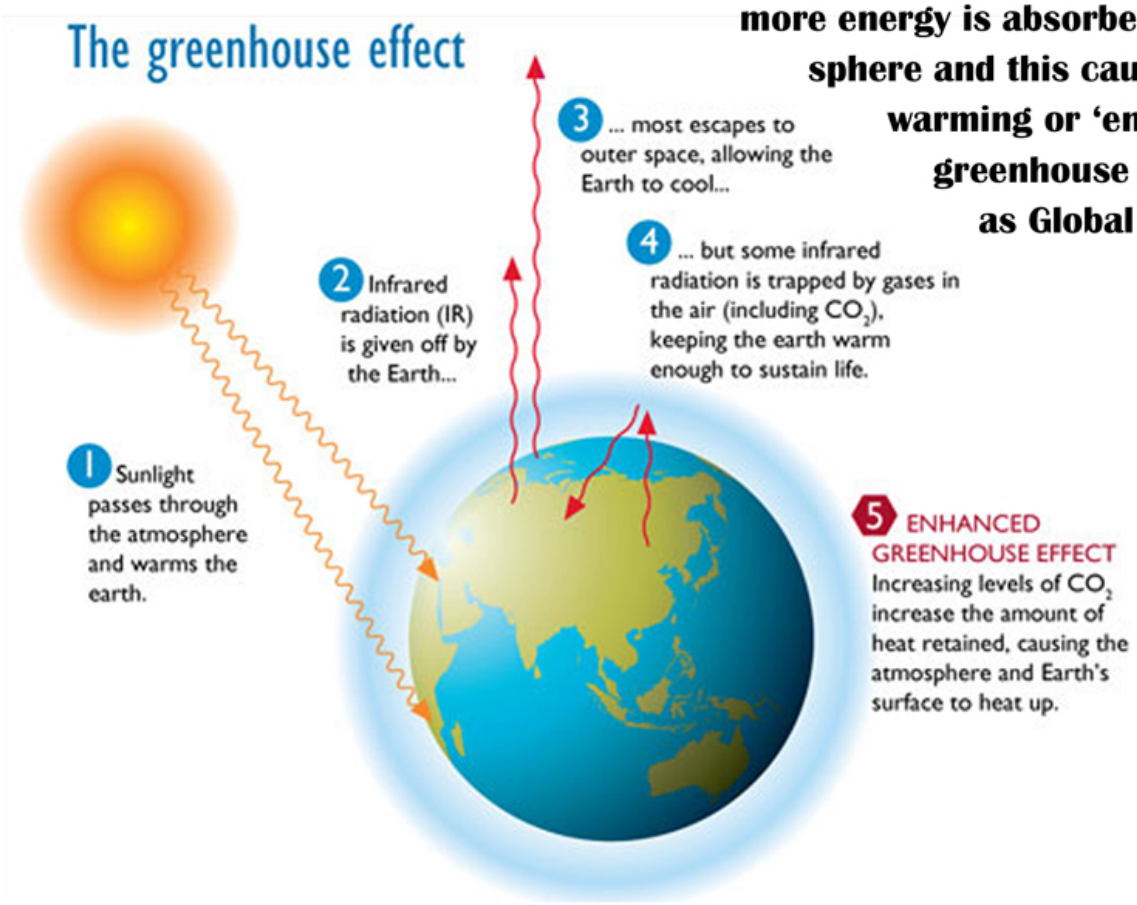
WHAT IS GLOBAL WARMING?

Global Warming is the increase of Earth's average surface temperature. A number of gases emitted from anthropogenic activities are getting accumulated in the atmosphere and giving rise to global warming. These gases trap heat and are causing enhanced Greenhouse Effect. The gases are collectively called greenhouse gases.

GREENHOUSE EFFECT

The Earth's atmosphere is all around us. When sunlight enters the Earth's atmosphere, it warms the land and water. Earth returns the energy to atmosphere in the form of Infrared rays. Some of it is absorbed in air in the atmosphere, while remaining goes back to space. Energy in the atmosphere warms the earth and make it habitable. This is natural greenhouse effect.

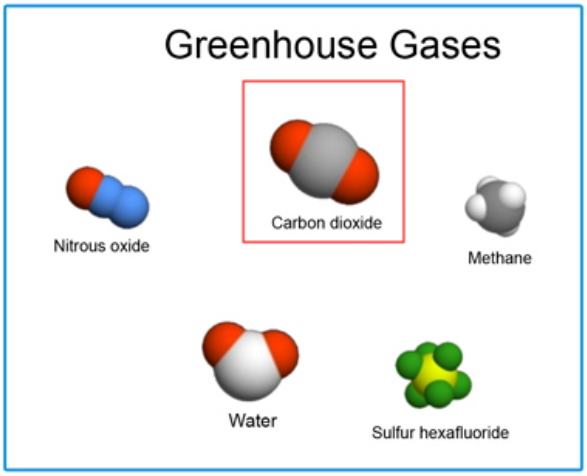
When greenhouse gases are added in the air from anthropogenic activities more energy is absorbed in the atmosphere and this causes more warming or 'enhanced greenhouse effect' known as Global Warming.



WHAT ARE THE GREENHOUSE GASES?

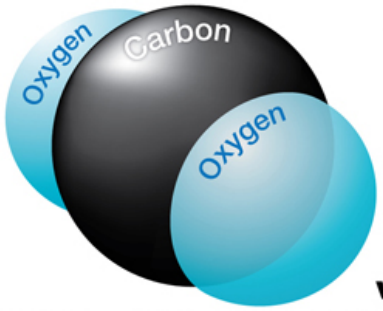
Greenhouse gases are carbon dioxide, nitrous oxide, methane and chlorofluorocarbons (also called c-gases). Carbon dioxide emissions from burning of fossil fuels or from deforestation trap more heat that would otherwise escape from Earth. Even slight increase in atmospheric levels of carbon dioxide (CO_2) can cause a substantial increase in temperature. Other gases are also emitted from industrial activities. These gases remain in air for a very long time.

Water vapor is another greenhouse gas, it is not produced directly by humankind in significant amount and it has a short life time, so can easily condense or evaporate. It does not add to global warming. Sulfur hexafluoride and troposphere ozone are minor greenhouse gases.



CO_2

Carbon dioxide (CO_2=1 carbon, 2 oxygen atoms) is a colorless, odourless and tasteless gas. It is about 1.5 times heavier than air. Under normal atmospheric conditions it is stable, inert, and nontoxic gas. In solid form it is known as dry ice.



The atmosphere contains approximately 0.03 percent carbon dioxide by volume. Nearly all animal life produces carbon dioxide during respiration, which is exhaled. Whereas plant life inhales or absorbs CO_2 from air. It is used in their growth or food production in a process called photosynthesis. When plants decompose, carbon dioxide is released as a by-product.

Scientific analysis and observations suggest that atmospheric concentrations of CO_2 has increased from about 270 ppm (parts per million) in the pre industrial era i.e. 18th century, to 400 ppm in 2012. It is believed that Earth's temperature has risen by 0. 89°C.

Some coal consuming industries are finding ways to capture carbon dioxide and storing it away from the atmosphese. This is known as carbon capture and storage.

IS GLOBAL WARMING SAME AS CLIMATE CHANGE?

Global Warming is the increase of the Earth's average surface temperature, due to build-up of greenhouse gases in the atmosphere.

Climate Change is long-term change in the climate due to interactions taking place in the earth dynamical system among atmosphere, biosphere, lithosphere and hydrosphere. It can lead to change in climate pattern.

LIKELY IMPACTS OF CLIMATE CHANGE

• Rising Sea level resulting in inundation of fresh water, marshlands, low-lying coastal areas and islands.

• Changes in rainfall pattern leading to droughts and fires in some areas, flooding in other areas.

• Increased frequency of extreme events on the planet such as frequent severe storms, cyclones, hurricanes, etc.

• Melting of the ice caps on mountains, resulting in loss of habitat like; Polar Bears and Penguins which are greatly endangered due to dwindling polar ice packs.

• Melting of glaciers and water shortage.

• Widespread vanishing of animal populations affecting biodiversity

• Impacting cropping patterns and agricultural practices.

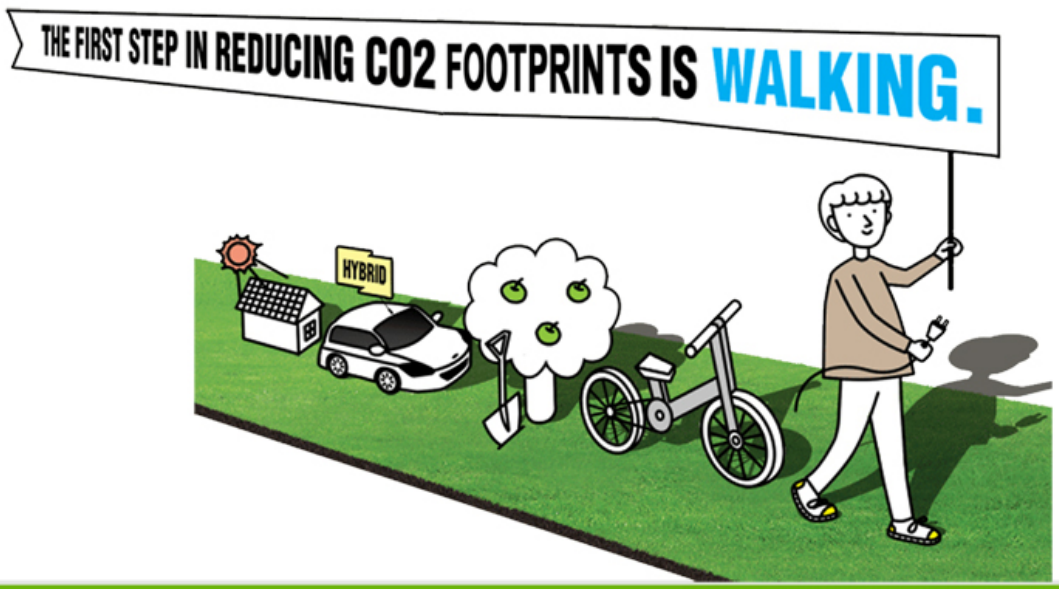
• Spread of vector borne diseases such as malaria to new regions and other health impect.

• Bleaching of Coral Reefs and loss of Plankton due to warming of seas and acidification of sea water.

WHAT YOU CAN DO?

Think about the things you do each day that use energy to reduce your carbon foot prints. All electrical gadgets like TV, computer, washing machine, refrigerator, air conditioners use electricity. The lights also consume electricity. Every time you ride in your car, it uses gasoline. All these are forms of energy and here are some things you can do to help prevent global warming:

- **Walk or take public transport to go everywhere and anywhere**
- **Protect and plant trees as they absorb carbon dioxide and act as carbon sinks**
- **3R-Recycle, reuse and reduce the consumption of materials like plastic bottles, paper etc.**
- **Switch - off lights when you go out of the room**
- **Change light-bulbs to energy saving bulbs like CFLs and LEDs**
- **Turn off computers and chargers and unplug them when they're not in use**
- **Wear warm cloths instead of using heater every time**
- **Wear lighter clothing when it's hot instead of putting on air-conditioner**
- **Only do full loads of laundry to save water**
- **Do not waste water, take shorter showers and use recycled water for gardening**
- **Reduce air pollution and keep your surroundings clean**
- **Construct green buildings and use solar energy**
- **Increased use of renewable energy provides clean energy (free from carbon)**



WHAT IS BEING DONE ABOUT GLOBAL WARMING?

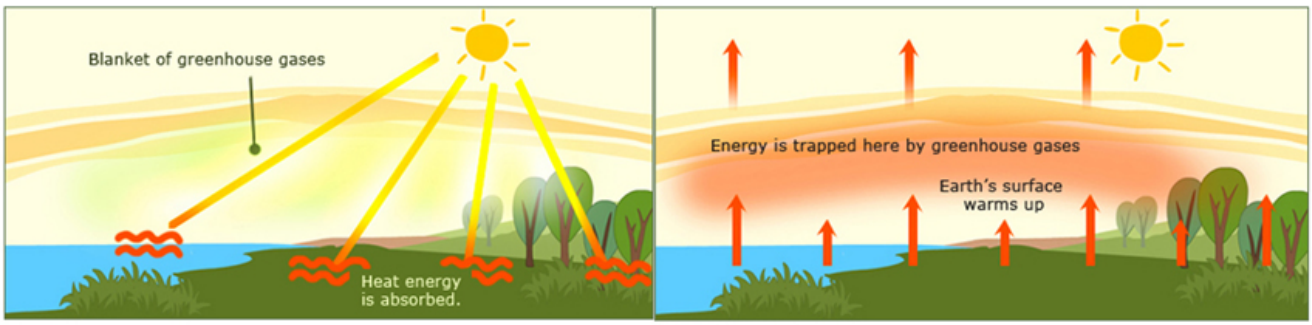
Global Warming and Climate Change are complex phenomena. They offer many challenges to the world communities. Internationally, United Nations (UN) has evoked United Nations Framework Convention on Climate Change, which has been signed by Governments of almost all countries. The UN holds meetings among country representatives to discuss the action and future plans for taking measures to stabilize greenhouse gas emissions.

INDIA'S NATIONAL CLIMATE CHANGE ACTION PLAN

India has announced National Action Plan on Climate Change. It pledges that India's per capita greenhouse gas emissions "will at no point exceed that of developed countries even as we pursue our development objectives".

- **National Solar Mission**
- **National Mission for Enhanced Energy Efficiency**
- **National Mission on Sustainable Habitat**
- **National Water Mission**
- **National Mission for Sustaining the Himalayan Ecosystem**
- **National Mission for a "Green India"**
- **National Mission for Sustainable Agriculture**
- **National Mission on Strategic Knowledge for Climate Change**

The program is monitored through appropriate indicators and methodologies will be developed to asses both avoided emissions and adaptation benefits.



Global Warming Explained

Climate Change Research Institute

C- 85 Shivalik
New Delhi 110017, India
Email: maltigoel2008@gmail.com,
contactus@ccri.in