

## 7

## ENVIRONMENTAL CHANGES

The air that envelopes the Earth from all sides is known as atmosphere. The atmosphere is getting polluted due to human activities. The environment gets polluted due to industries, factories, power stations and vehicles.

The changes that occur in temperature, direction of wind, moisture, etc. due to global warming are known as environmental changes.

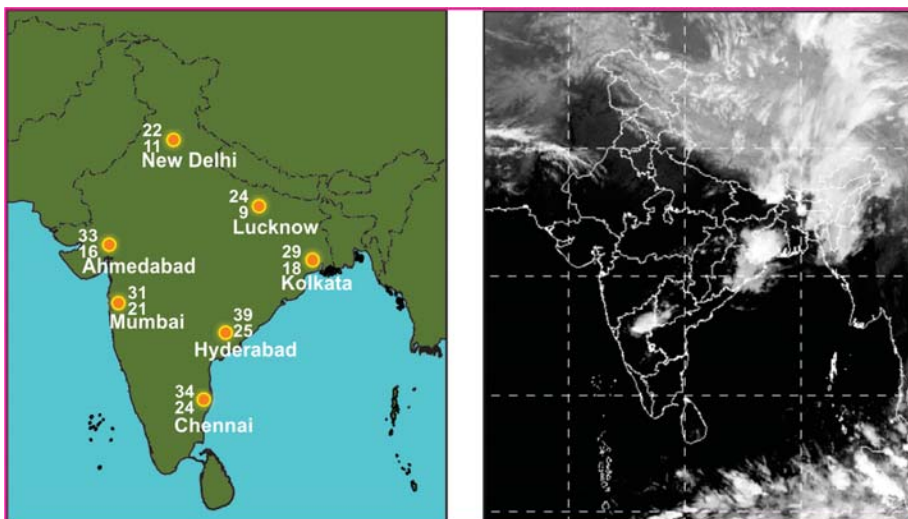
Find out the places that experience extreme rain, heat, cold and extreme climatic conditions with the help of the given table. Also find out the reasons for the same.

No.	Country	Heat	Cold	Rain	Reason
1	Russia	15°C	- 20°C	100 cm	
2	Iran	30°C	10°C	50 cm	
3	Brazil	38°C	25°C	250 cm	
4	Norway	10°C	- 40° C	50 cm	
5	Philippines	35°C	30°C	300 cm	
6	Saudi Arabia	45°C	29°C	10 cm	

### What is weather?

The condition of temperature, rain and moisture (humidity) in any region at a particular point of time is known as weather.

What would be the weather of this place? Write your answer in your notebook after carefully observing the given maps.



### 7.1 India climate

## What is climate?

The average condition of rain, temperature and moisture for over more than 35 years in any is known as climate.



## 7.2 Scenes of Greenhouse Effect



## 7.3 Greenhouse Farming

### Greenhouse Farming

Countries with a cold climate receive less heat from the sun. This hampers the growth of plants and vegetables. Hence, arrangements are made to accumulate adequate heat from the sun. The roof is made of either glass or cloth to allow the sunrays to penetrate and sustain the heat inside the building, and this practice is known as the 'Green Huse Farming'.



## Think

- *Why are the doors and windows made of glass in countries that have cold climate?*

## Changing Climate



### 7.4 Changing climate

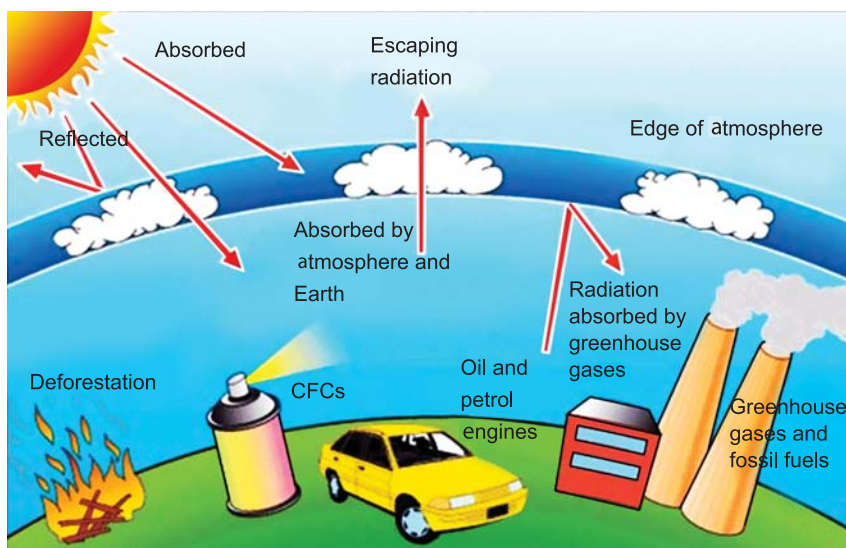
Write one sentence about each of the pictures given above in your notebook.

## What is Global warming?

Global warming refers to an unequal and continual rise in the average temperature of Earth's climate system due to the greenhouse gases.

It occurs when certain gases in the atmosphere entrap infrared radiation (U V rays).

This effect makes the planet warmer which subsequently reaches to Global Warming.



### 7.5 Greenhouse Effect and Global warming

## Do it yourself

- *Cover yourself with a blanket for 10 minutes. What did you experience? This is what the Green House effect is.*

### News from newspaper

Average increase of 5°C in the temperature in West Europe, heat experienced.

14°C temperature in Darjeeling reaches to maximum of 28°C (2009 C.E.)

Snowfall in desert.

Mumbai received 942 ml rain in one day. (2005 C.E.)

Increasing temperature in Australia. (2005 C.E.)

Sundervan is submerging.

Reduction of 5 km in Khumbu, snow river of Nepal.

Ice cap of the size of 3250 sq. kms. melts within 35 days in Antarctica.

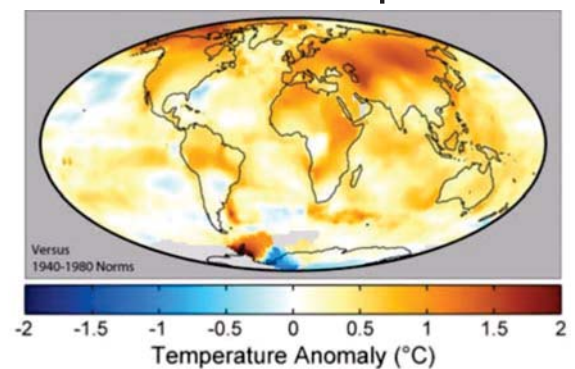
Sources of river are drying up.

### How does the Earth get heated?

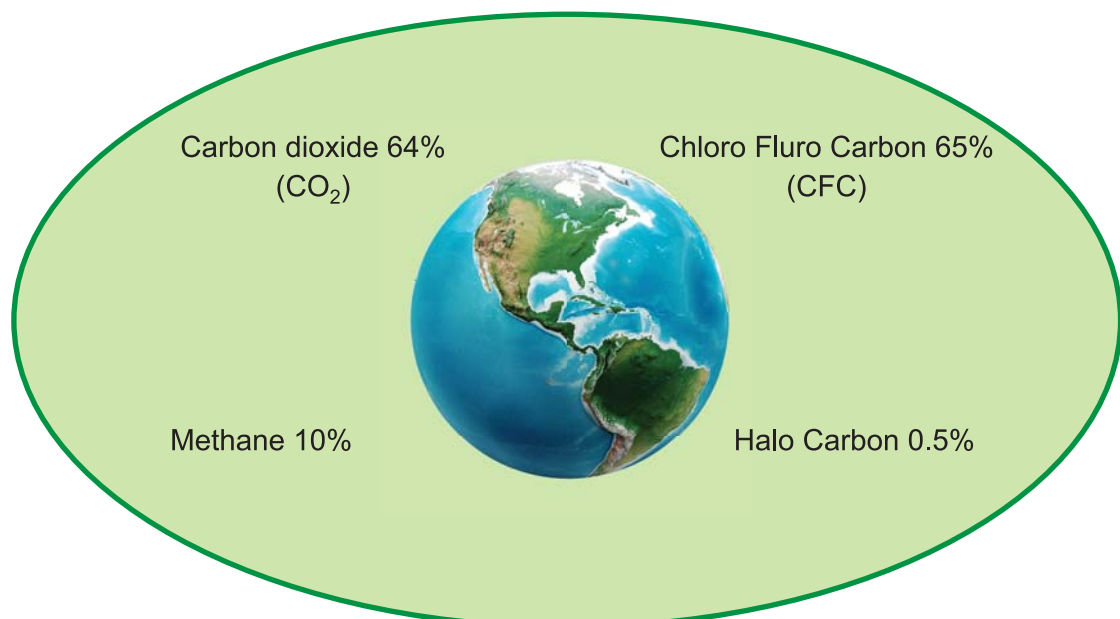
The greenhouse gases like carbon dioxide, Methane, Nitrous Oxide, Chloro Fluro Carbon (CFC) and halo carbons play an active role in the Greenhouse effect. The increase in the proportion of these gases leads to the problem of global warming and climate change.

**Increase in the temperature by 0.6°C in the last 100 years.**

1995-2004 Mean temperature



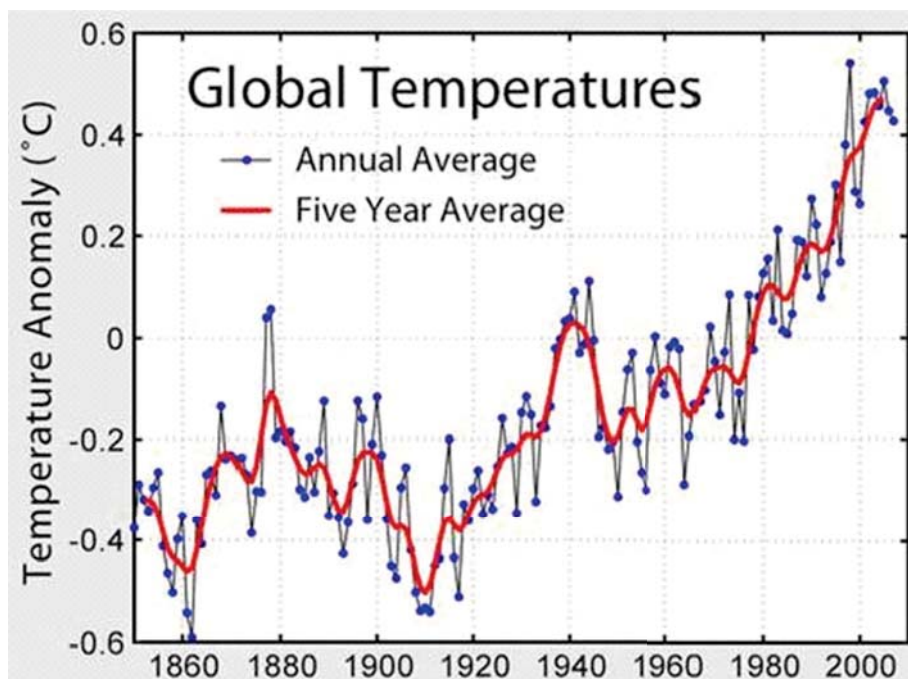
**7.6 Figure showing temperature on the Earth**



### 7.7 Each Person in the world releases 4.5 metric tons of CO<sub>2</sub>

100 years ago, the amount of CO<sub>2</sub> was 275 PPM, today it is 350 PPM.

PPM means Part Per Million For example 280 PPM = 0.28%



### 7.8 Increased average temperature on Earth in the last 150 years.

#### Think

- *We know that a definite quantity of sugar or salt has to be added in vegetables or tea. What would happen if we add more sugar or salt? In the same way, there is a balance of proportion of gases in the atmosphere. Imagine what would happen to this balance if the proportion of Carbon Dioxide increases in the atmosphere?*

Study the table given above. State how much are we responsible in adding to the temperature of the Earth?

No.	Place/Thing	Time	Proportion of gases released that aggravates the greenhouse effect
1	Thermal power-station (200 MW)	Yearly	9 lakh ton
2	Motor car	Yearly	17 crore ton
3	A.C. (on an average 2 hours)	24 hours	2230 kg
4	T.V.	24 hours	190 kg
5	Tube light	24 hours	88 kg
6	Computer	24 hours	130 kg
7	Freeze	24 hours	920 kg



## Methane (CH<sub>4</sub>)

The massive increase in methane proportion from 315 PPM in the year 1750 to 1764 PPM in the year 2005 was due to the reasons listed below.

No.	Reason	Release of Methane
1.	Exhaling of animals and metabolism process	14 crore ton
2.	Paddy cultivation	15 crore ton
3.	Decomposition of the bio degradable waste	7 crore ton

### Thing to Know

- *All the things used by human in one day has 80% of the air in it. A man breathes 22000 times every day. In this way, a man consumes 16 kg of oxygen from the environment per day.*

## Nitrous oxide

The proportion of nitrous oxide has increased from 270 PPM to recent 319 PPM.

## Chloro Fluro Carbon (CFC)

Due to the use of foam, plastic, refrigerators, A.C. circuit aerosol spray (the minute particles having the size ranging from 1 micron - 10 micron is known as aerosol), etc. there has been an increase in the CFC.

### Thing to Know

- *As per the resolution passed by the UN on 23<sup>rd</sup> January, 1995, 16<sup>th</sup> September is observed as the Ozone Day.*
- *After 1980, year 2007 was the hottest year.*

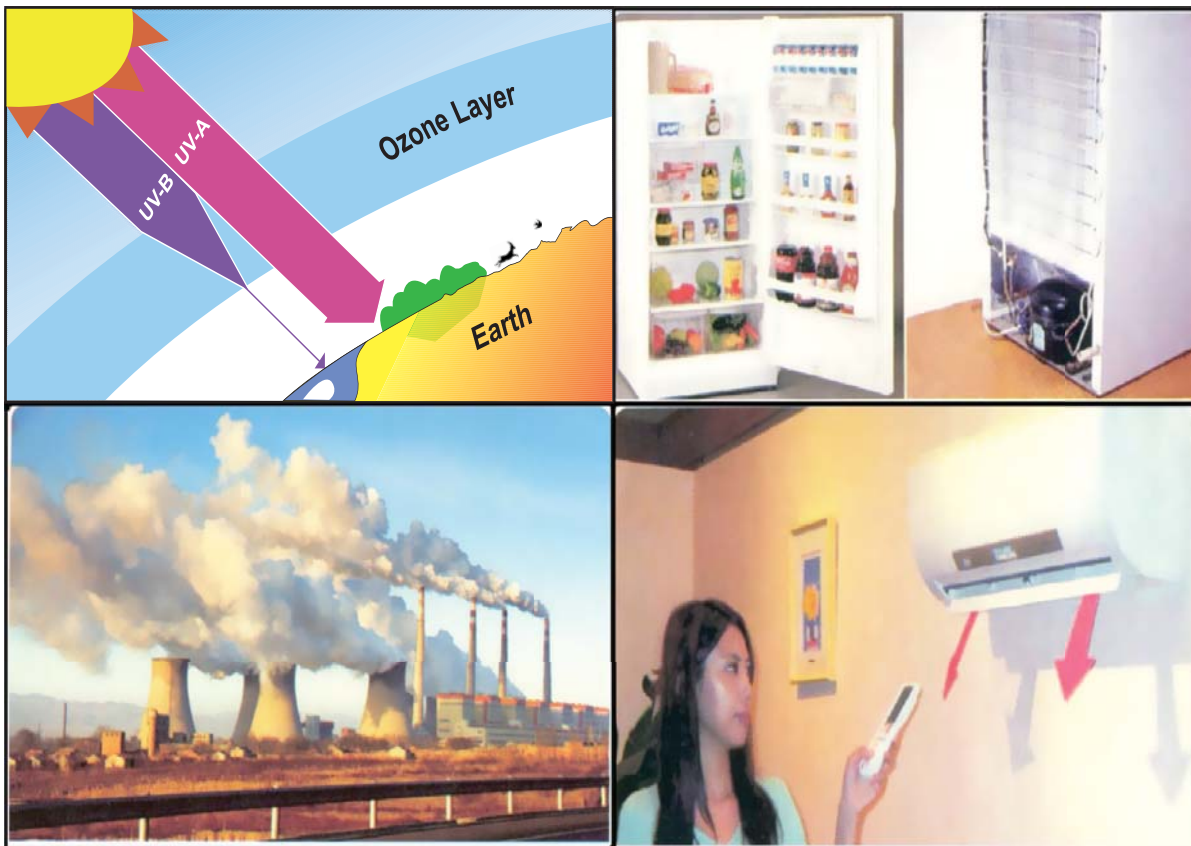
## Effects of global warming

Changes are observed in the growth and development of the vegetation. Certain species of birds are now disappearing, such as sparrows and vultures. 2000 glaciers of Himalayas have receded / melted.



**7.9: Gradual changes observed in the glaciers**

- There has been an increase in natural calamities like famine, cyclone, excessive rain and floods in the last 10 years.
- The places receiving heavy rainfall are now experiencing less rainfall. Rajasthan and Dubai experienced heavy rain and there is scanty of rain in Cherrapunji.
- The production of pulses has gone down.
- The level of ground water has decreased.
- The melting of glaciers has increased the water level in oceans. This has aggravated the erosion of coastline.
- Human beings will fall victims to dehydration and malnutrition due to the increase in temperature.
- There will be changes in the cycle of seasons. The characteristics of summer and winter season will change.
- The salinity of the soil in Gujarat will increase due to the increase of 25 cm in sea level.
- There is a marked decline in the agricultural production. The frequency of diseases like cholera, dengue, malaria, yellow fever, swine flu, etc. has increased.
- The areas near the coast of Maldives, Bangladesh, Philippines, West Indies and Australia have submerged.
- According to an institution named 'Greenpeace' approximately 55 lakh people living in Gujarat will have to migrate in the year 2100 C.E.
- The flowers are losing their fragrance due to global warming. Beehives are disappearing fast.



### 7.10 Factors increasing the temperature on Earth

See Image 7.10 and make a note based on it of how much CO<sub>2</sub> is being released.

## Non-Conventional sources of energy



**Solar energy**



**Wind energy**



**Biomass**



**Tidal energy**



## Measures to prevent global warming

- *Reduce the use of sources that release CO<sub>2</sub>.*
- *Afforestation and conservation of forests should be done.*
- *Growing trees help to reduce carbon dioxide.*
- *Avoid the use of plastics.*
- *Optimum use of manure and pesticides.*
- *Adopt organic farming (use of green manure and cattle manure).*
- *Add Biotics in the food for animals.*
- *Optimum use of household appliances.*
- *Proper use of means of transport.*
- *Check the growth of human population.*
- *Design the buildings with sufficient ventilation to save electricity.*
- *Increase the use of eco-friendly papers.*
- *Grow plants and trees around your house.*
- *Make optimum use of natural resources.*
- *Use petroleum products judiciously.*
- *Use water carefully.*
- *Practice rain water harvesting.*
- *Increase the use of CNG and non-conventional sources of energy.*

### Think

- *What kind of residence should we have to protect ourselves from the effect of increase in temperature?*

### Thing to Know

- *To make one ton of paper*
  - *4400 kw electricity*
  - *30,000 liters water*
  - *Wood of 11 trees is required.*

## Global policy to protect environment

On realizing that human activities are the root cause of destruction of the environment, the countries of the world gathered at Stockholm, the capital of Sweden in 1972, to think of ways to protect the environment. Another convention was held at Rio-De-Janeiro, Brazil.

In the meeting held at Copenhagen, capital city of Denmark in the year 2009, to discuss global warming, it was observed that the developed nations are not accepting the carbon cut (the technique to reduce the emission of greenhouse gases) and the developing nations were increasing pressure for the reduction of emission of greenhouse gases. It was decided to give an aid of 100 billion dollars for the development of developing nations. In this meeting 59 research papers from 45 countries were presented and through it, the leaders of the world were made to think seriously regarding the changing climate. On an average a citizen in the world emits 4.5 metric ton carbon dioxide, Indian citizen emits 1.2 metric ton carbon dioxide. Other developing nations release far lesser carbon dioxide gas. Large amount of concessions should be given for development and more restrictions should be imposed on the countries like the USA as an average American emits 20.6 metric ton carbon dioxide.

## EXERCISES

### Q.1 Answer the following questions

1. What is climate?
2. What do you mean by 'Greenhouse Effect'?
3. What is global warming?
4. List down the possible adverse effects of global warming.
5. List down the home appliances of daily use that add to global warming.
6. Which country hosted the last world convention to protect the environment?

### Q.2 Fill in the blanks with appropriate words

1. Increase in the proportion of the ..... gas has led to an increase in the global temperature.
2. CFC is released in maximum due to the use of ..... appliance.
3. There has been an increase of .....<sup>0</sup>C in the temperature of the Earth in the last 100 years.
4. It is necessary to make ..... use of resources to check the increase in the global temperature.

### Q.3 Write short note on

1. What steps should be taken to prevent global warming?
2. Discuss the adverse effects of climate change.