

Unit IV: Sustainability and Management

**4.8 CLIMATE CHANGE**

Climate change refers to the long-term shifts in temperatures and weather pattern. These changes may be natural (through variations in solar cycle) (or) artificial (human activities like burning of fossil fuels like coal, oil and gases).

**4.8.1 Causes of climate change**

1. Presence of green house gases in the atmosphere increases the global temperature. 2. Depletion of ozone layer also increases the global temperature.
3. Uneven distribution of rainfall.
4. Rotation of earth on its axis.
5. Seasonal changes.

**4.8.2 Effect (or) Issues of climate change**

1. Even small changes in climatic conditions may disturb agriculture that would lead to migration of animals including humans.
2. Climate change may upset the hydrological cycle, results in floods and droughts in different regions of the world.
3. Global pattern of winds and ocean currents also gets disturbed by climate.
4. More frequent and intense drought.
5. Sea levels gets raised.
6. Melting glaciers and warming oceans can directly harm animals and destroy the places they live.
7. Higher temperature increases heat related illnesses and make working outdoors more difficult.
8. If conditions are hot wild fires start more easily and spread more rapidly. global
9. As green house concentration increases, surface temperature also increases.

**4.8.3 Possible solutions to climate change**

1. Burning of fossil fuels like coal, oil and gas must be avoided.
2. Renewable energy sources like solar, wind, tidal and geothermal power must be used instead of fossil fuels.
3. Reducing petrol and diesel vehicles, planes and ships and switching to electric vehicles stop climate change.
4. Heat our homes in a green way, by insulating walls and roofs and switching away from oil (or) gas boilers to heat pumps.
5. The best way for individuals to help stop climate change is by reducing their meat and dairy consumption (or) by going fully vegetarian.
6. Planting more trees in the right place will absorb more carbon from the emissions.
7. Protect forests, which fight against climate change.
8. Oceans also absorb large amounts of CO from the atmosphere, which helps to keep our climate stable.
9. Reducing overall consumption in more wealthy countries can help put less strain on the planet.
10. Avoid of using plastics.
11. Reduce carbon pollution to avoid the worst consequence of climate change. 12. Provide financial support to developing countries, so people and nature can successfully adapt.

**4.9 CASE STUDIES**

**4.9.1 Climate change on Chennai, East Coast Road (ECR) and Old Mahabalipuram Road (OMR)**

ECR and OMR are the today's landmark will receive the highest climate impact. Due to Chennai's land use patterns, population stress and abuse of natural resources, climate has changed drastically in the last few years. Climate induced impacts like drought, floods, heavy rains and winds are becoming increasingly evident in the city.

On one end of the continuum is summer water crises and on the other end is monsoonal flood disasters.

**Reason for flood in Chennai**

Increasing population and building / Land use pattern have changed the natural hydrology of the city. The water which needs to naturally drain into the sea via, the regional watershed are now blocked by buildings and artificial man-made structures. These are all reason for flood in Chennai city.

### **Remedy**

Researchers predicts that Chennai's climate is more unpredictable and aggressive. Climate change will affect people and the environment.

People need to take action to reduce the emission of green house gases that is the root cause for climate change.

#### **4.9.2 Climate change on Chennai, Ennore**

Ennore thermal power station (ETPS), a 660 MW coal-fired thermal power plant in Ennore at north Chennai, CPCL's oil refinery, Madras Fertilizers Ltd, Tamil Nadu Petroproducts Ltd and Madras Petrochemical Ltd. These six factories were, operating in violation of prescribed air pollution norms for nearly 60%, responsible for drastic climate change.

More than 56 lakh tonnes of coal ash is spread over the river bed with flyash deposits ranging in depth from 1 ft to 8 ft.

### **Issues (or) effects**

1. Ground-level particulate matter pollution due to emissions, from above said 6 factories at around Ennore, exceeded the carrying capacity of the area in the vicinity of the plant.
2. Ground-level SO<sub>2</sub> and NO<sub>2</sub> pollution exceeded the carrying capacity of the area.
3. In Ennore, children and women are particularly affected and gynecological problems particularly reported by respondents. were
4. Natural drainage pattern have been considerably altered to fly ash pond construction and ash contamination. This will have an impact on local hydrology and flooding.
5. Climate change manifeasts in the form of rising sea levels, increased heat stress, intense rain events and droughts and ocean desertification due to warming seas More than 120 million litres of hot waste water is discharged daily, from Ennore power plant, into the Ocean. Such discharge in an already warming Ocean will create localised marine deserts.

## **4.10 CARBON CREDIT**

### **4.10.1 Definition**

A carbon credit is a tradable permit (or) certificate that represents the right to emit a set amount of CO<sub>2</sub>, (or) 1 tone of CO<sub>2</sub> (or) the equivalent amount of green house gas.

### **4.10.2 Concept**

Kyoto protocol is an international agreement that aims to manage and reduce carbon dioxide emissions and green house gases. Kyoto protocol introduced the concept of carbon credits.

According to this, a country should reduce carbon emissions in the atmosphere.

- (i) A carbon credit is a tradable certificate that allows its holder to emit green house gases.
- (ii) One carbon credit is equal to one ton of carbon dioxide.
- (iii) Countries need to reduce their emissions by 5.2% compared to the numbers recorded.
- (iv) Countries and companies need to be designed to reduce carbon emissions without the need to buy credits.
- (v) Less the purchase, less will be the carbon release into the atmosphere.

### **4.10.3 Types of carbon credits**

There are two types of carbon credits.

#### **1. Voluntary emissions reduction (VER)**

It is a carbon offset that is exchanged in the over-the-counter (or) voluntary market for credits.

#### **2. Certified emissions reduction (CER)**

It relies on emission credits created through a regulatory frame work with the purpose of off-setting a project's emissions.

#### 4.10.4 How to get carbon credit

Carbon credits and carbon markets are a component of a national and international attempts to mitigate the growth in concentrations of green house gases (GHGs). One carbon credit is equal to one ton of CO, (or) CO<sub>2</sub> equivalent gases.

There are many companies, that sell carbon credits to commercial and individual customers who are interested in lowering their carbon foot print. Buyers and sellers can also use an exchange platform to trade, which is like a stock exchange for carbon credits.

#### 4.10.5 Advantages and Disadvantages of Carbon Credits

##### Advantages of Carbon Credit

1. Each carbon credit corresponds to one ton of carbon that was not emitted into the atmosphere.
2. The company that does not have an alternative to reduce its emission finds an advantage in the purchase of this credit.
3. The purchase of carbon credits by companies that are environmentally conscious is favorable for their image.
4. Sometimes the company behaves sustainably, but it cannot stop emitting some amount of carbon. In this case, the purchase of credit shows how much the company activities. cares about encouraging sustainable
5. It enables companies to support decarbonization beyond their own carbon footprint.

##### Disadvantages of Carbon Credit

1. Some institutions and countries can accommodate themselves in the exchange market to continue emitting their greenhouse gases.
2. Companies do not invest in action to avoid emissions because they are able to buy unlimited credits.
3. The reduction of 1 ton of carbon that is 1 credit, will never be enough.
4. It is an alternative for emergency needs, not to rest on the fact that the other has saved.
5. Main focus of carbon credit is to reduce green house gas emissions, but it is not possible to stop the negative impacts caused by the globe warming.

