

Q No#5:-

(b)

### 1) Introduction:-

With the genesis of industrial revolution, the pace at which climate change is happening has increased exponentially. According to Matt Graetz, "Climate change is not something people choose to believe or not; it is happening." The climate change is aggravated by many drivers like deforestation, emissions of greenhouse gases into the atmosphere, resorting to fossil fuels for catering energy needs, and there are many indicators which substantiate the climate change <sup>is occurring</sup> like temperature changes, rapid melting of glaciers etc. With the surge in climate change, many societal and natural systems are being affected like the uptick in extreme floods, biodiversity loss, collapsing of infrastructure, etc.

### 2) Significance of indicators:-

Before discussing significance of indicators, one should have to know about indicators.

#### (a) Indicators:-

Indicators show the state or trends of environmental or societal state in a given area over a specified period of time.

### For example:-

The increase in global average temperatures above the pre-industrial level is an indicator of climate change.

The importance of indicators is that they help to provide evidences of the cause and effects of climate change and alert the world authorities by noting the trends about the anticipated climatic apocalypses.

### 3) Drivers (and) indicators of climate change:-

The drivers (the activities which incite the global climate change) are briefly discussed below:-

#### (a) Deforestation:-

The forest cover serve as the carbon sink. It takes up excess  $\text{CO}_2$  from the atmosphere, which causes global warming. The clearing of forests for building architectures and for agricultural purposes is among one of the drivers of the climate change.

#### (b) Emissions of greenhouse gases:-

Another driver for climate change is the emission of greenhouse gases including  $\text{CO}_2$ ,  $\text{N}_2\text{O}$ , methane etc. capture the excessive heat released by the earth after absorbing it from solar radiations. These gases result in the increase of global average temperatures.

### (c) Reliance on fossil fuels:-

Reliance on fossil fuels for fulfilling the energy needs is also among one of the drivers of climate change. The power stations which produce electricity and by these fossil fuels discharge large amounts of greenhouse gases into the atmosphere which is intensifying the climate change.

### (d) Eutrophication:-

Eutrophication of the oceans and freshwater bodies is also among one of the drivers of climate change. The growth of algae results in the demise of aquatic life, which absorbs (large) <sup>excessive</sup> amount of  $\text{CO}_2$  from the atmosphere.

### 4) Indicators of climate change:-

The indicators of climate change which assist to identify the causes and effects of climate change are discussed below:-

## (a) Atmospheric Concentrations of greenhouse gases:

Atmospheric concentrations of greenhouse gases is among of the indicators of climate change. It tracks the concentrations of ozone in the layers of earth's atmosphere and indicates that the concentration of ozone in the atmosphere is decreasing.

## (b) Climate forcing:

Climate forcing is also another indicator of climate change. It shows the variety of important short-lived substances that affect the climate. It include water vapors, ozone in the troposphere, pollutants that lead to ozone formation.

## (c) <sup>Accelerated</sup> Rapid melting of glaciers:

Rapid <sup>one</sup> melting of glaciers is also among of the indicators of climate change. With the increase in concentrations of greenhouse gases in the atmosphere, more <sup>accelerated</sup> (~~rapid~~) melting of glaciers is taking place.

## (d) Temperature changes:

Temperature changes is also ~~(another the)~~ another indicator of climate change.

The aggregated concentrations of greenhouse gases are causing the variations in global average temperature across the globe. Since pre-industrial era, the average global temperature seen an exacerbation of  $1^{\circ}\text{C}$ .

### 5) Societal and natural systems effects:

Climate change induces many effects on societal and natural systems globally. Some of the societal and natural system impacts are given described below:

#### (a) Biodiversity loss:

Climate change causes the loss of biodiversity. Climate change results in the death of many wildlife, which impacts the societies as well as they are source of food chains for many people.

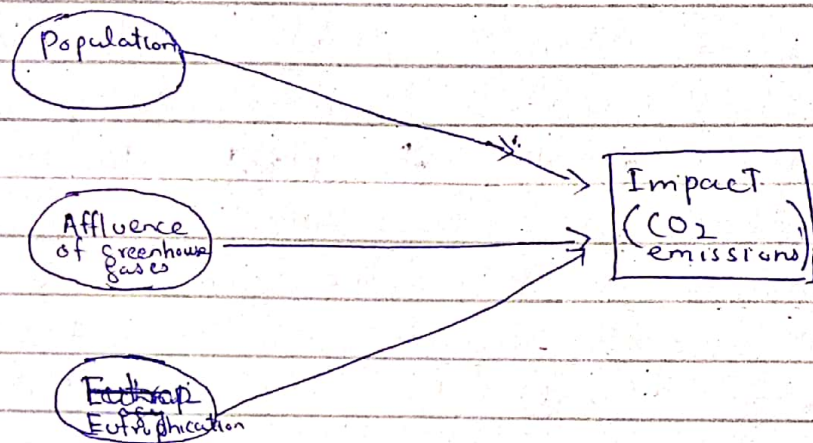
#### (b) Infrastructure damage:

Climate change triggers the infrastructure damage. It results in excessive floods which causes the buildings, roads, bridges collapse.

#### (c) Decline in food production:

It aggravates the decline in food production which affect the societies badly. People in societies do not find / face difficulty in seeking food products to thrive.

### Drivers of climate change



### 6) Conclusion:

In the nutshell, climate change has many drivers like eutrophication, emissions of greenhouse gases etc and there are many indicators of it like temperature changes, accelerated glacial melting. etc. Climate change renders significant impacts on natural <sup>and</sup> societal systems like infrastructure damage, biodiversity loss etc.

