



**ENVIRONMENTAL DEGRADATION: A CRITICAL REVIEW**

**Kaushalendra Kumar**

**Department of Zoology**

**Pt. S. N. S. Govt. P. G. College, Shahdol, M.P.**

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**ABSTRACT**

The Environment which provides food, clothing and shelter to almost all living creatures of the different ecological habitats is getting deteriorating day to day. The sole cause of such deterioration is perhaps only the anthropogenic interference. The industrial development, the green revolution and the unsustainable chemical revolution have become the key factor for environmental breakdown. These factors of course, have made human self dependent at one hand but its unlimited usage have been proved as one of the major issues for degradation. The different types of pollutions have converged to cause abruption in environmental mechanism. These are manifested in the form of Global Warming, Green House Effect, Ozone Depletion, Climatic Change, Abruption in Seasonal Variation, deforestation, loss of habitats, extinction of biotic fauna and flora, raising of sea level, scarcity of drinking water (perhaps inevitable cause of **third world war**) and Recurrence of different Natural Calamities like high intensity earthquake, devastating flood, uncontrolled sea tides & storm, fast melting of glaciers etc. These changes are of course natural as environment is ever changeable but the human interference has increased rapidly its frequency of occurrence.

In the world Summit for climatic change held recently in Paris, all these issues have been discussed and a resolution to prevent our environment by decreasing the carbon emission has been passed. Now it's time to think that how to save our environment?

The only answer of this burning question is SUSTAINABLE DEVELOPMENT perhaps.

**GLOBAL WARMING**

- The global warming can be defined as “the raising in the average temperature of the Earth and its surroundings with an impact on climate system and its related components.
- Besides global warming now a days there is threats of Climate system warming and Ocean warming.
- Reports of Intergovernmental Panel on Climate Change (IPCC) (2014) advocate that the chief cause of global warming is the increasing concentrations of greenhouse gases and other anthropogenic activities. It also advocates that during the 21<sup>st</sup> century the global surface temperature is likely to rise a minimum of 0.3 to 1.7<sup>0</sup> C and a maximum of 2.6 to 4.8<sup>0</sup>C.
- The devastating impacts of global warming can be seen in the form of warming global temperature, climate change, rising sea levels, changing precipitation, expansion of deserts, warming of ice in Arctic, more frequent extreme weather events (heat waves, droughts, heavy rain fall, floods and heavy snow fall), ocean acidification, decreasing crop yields and species extinction due to shifting temperature regimes.
- The temperature of land has increased twice as fast as ocean temperature (0.25<sup>0</sup>C per decade against 0.13<sup>0</sup>C per decade).



- The average Arctic temperature has been increasing at twice rate.

**GREEN HOUSE GASES**

- The greenhouse gases are those gases that absorb and emit infrared radiation to make warm the lower atmosphere surface, thus causing global warming. The effects caused by green house gas are termed as green house effect ( Joseph Fourier, 1824; John Tyndall, 1860; Svante Arrhenius, 1896 and Guy Stewart Callendar, 1960)
- The primary green house gases are – Water vapour, Carbon dioxide, Methane, Nitrous oxide and Ozone.
- The green house gases present in environment does not affect naturally but its increased concentration due to human activities affect merely.
- Due to human activities after industrial revolution the atmospheric concentration of carbon dioxide has increased 40% from 280 ppm in 1750 to 400 ppm in 2015.
- This increase has occurred despite the uptake of large portion of the emissions by various “sinks” involved in carbon cycle.
- It is also evident that the atmospheres of Venus, Mars and Titan contain gases that cause green house effect.
- As per estimate of various organizations the earth’s surface temperature could exceed historical values as early as 2047, if the green house gas emissions continue at the present rate that affect potentially on ecosystems, biodiversity and the livelihoods of people worldwide.

**The Table showing the gases contributing green house effect:**

| Compound                | Formula          | Concentration in atmosphere (ppm) | Contribution (%) |
|-------------------------|------------------|-----------------------------------|------------------|
| Water vapors and clouds | H <sub>2</sub> O | 10 – 50,000                       | 36 – 72%         |
| Carbon dioxide          | CO <sub>2</sub>  | ~400                              | 9-26%            |
| Methane                 | CH <sub>4</sub>  | ~1.8                              | 4-9%             |
| Ozone                   | O <sub>3</sub>   | 2 - 8                             | 3 – 7%           |

**Table showing sources of CO<sub>2</sub> from fossil fuel combustion (Human activities):**

| Fossil fuel combustion sources        | Contribution |
|---------------------------------------|--------------|
| Liquid fuels (gasoline, fuel oil)     | 36%          |
| Solid fuel (Coal)                     | 35%          |
| Gaseous fuels (natural gas)           | 20%          |
| Cement production                     | 3%           |
| Flaring gas industrially and at wells | <1%          |
| Non – fuel hydrocarbons               | <1%          |

The chief sources of greenhouse gases due to human activity are –

- Burning of fossil fuels and deforestation cause higher concentration of carbon dioxide in the atmosphere.
- Livestock enteric fermentation and manure management, paddy rice farming, land use and wetland changes, pipeline losses and covered vented landfill lead higher concentration of methane in atmosphere.
- Use of chlorofluorocarbons in refrigerator, in fire suppression system and in manufacturing processes.



- Use of fertilizers in agricultural systems lead to higher concentration of nitrous oxide.

#### Top CO<sub>2</sub> emitters countries

| Country                    | % of global total annual emissions | Tonnes of greenhouse gases per capita |
|----------------------------|------------------------------------|---------------------------------------|
| People's Republic of China | 23.6                               | 5.13                                  |
| United States of America   | 17.9                               | 16.9                                  |
| India                      | 5.5                                | 1.37                                  |
| Russian Federation         | 5.3                                | 10.8                                  |
| Japan                      | 3.8                                | 8.6                                   |
| Germany                    | 2.6                                | 9.2                                   |
| Islamic Republic of Iran   | 1.8                                | 7.3                                   |
| Canada                     | 1.8                                | 15.4                                  |
| Korea                      | 1.8                                | 10.6                                  |

(Data from World Resources Institute, Washington, USA)

#### AEROSOL AND SOOT

- Aerosols are solid and liquid particles, produced by volcanoes and human made pollutants, also supposed to be the main cause of global dimming.
- Atmospheric soot absorbs solar radiation directly and heats the atmosphere and cools the surface. In rural India where soot production is comparatively higher, the atmospheric soot masks the greenhouse gases and thus becomes causative agent for global warming.

#### VARIATION IN EARTH'S ORBIT

- Variations in earth orbital cycle due to tilting of earth's axis and changing the shape of orbit may lead to a new glacial period in the future.
- A large number of Environmentalists are of opinion that a new glacial period would be expected in coming future if the atmospheric concentration of carbon dioxide exceeds above 300 ppm.
- This has also become an anthropogenic source of climate change.

#### TOURISM

- Tourism is a significant contributor to the increasing concentrations of greenhouse gases.
- According to UNEP the number of international tourism is expected to increase from 594 million in 1996 to 1.6 billion by 2020.

#### IMPACT OF GLOBAL WARMING

The dreadful impact of global warming can be assessed as –

- Climate change



- Change in timing of weather
- Poleward and upward shifting of plants and animals
- Damaging ecosystems like tundra, mangroves and coral reefs
- Extinction of many species and loss of biodiversity
- Excess carbon dioxide concentration can lead to ocean acidity and ocean deoxygenation causing extinction of aquatic organisms.

**LIST OF CYCLONES IN INDIA**

| Year of Occurrence | Name of cyclone | Lowest Pressure (mbar) | Name of State  |
|--------------------|-----------------|------------------------|----------------|
| 2000               | BOB 06          | 970                    | Kerala         |
| 2000               | BOB 05          | 958                    | Tamil nadu     |
| 2001               | ARB 01          | 932                    | Gujrat         |
| 2003               | 03B             | 992                    | Andhra Pradesh |
| 2004               | Onil            | 990                    | Gujrat         |
| 2005               | Fanoos          | 999                    | Kerala         |
| 2007               | Yemyin          | 986                    | Gujrat         |
| 2007               | Yemyin          | 986                    | Andhra Pradesh |
| 2008               | Nisha           | 996                    | Tamil nadu     |
| 2008               | Khai-Muk        | 996                    | Andhra Pradesh |
| 2009               | Phyan           | 988                    | Maharashtra    |
| 2010               | Jal             | 988                    | Maharashtra    |
| 2010               | Laila           | 986                    | Amdhra Pradesh |
| 2010               | Jal             | 988                    | Tamilnadu      |
| 2011               | Thane           | 972                    | Tamilnadu      |
| 2012               | Nilam           | 982                    | Andhra Pradesh |
| 2012               | Nilam           | 992                    | Tamilnadu      |
| 2013               | Madi            | 986                    | Tamilnadu      |
| 2013               | Phailin         | 940                    | Odisha         |
| 2013               | Lehar           | 980                    | Andhra Pradesh |
| 2013               | Helen           | 990                    | Andhra Pradesh |
| 2014               | Hudhud          | 960                    | Odisha         |
| 2014               | Hudhud          | 940                    | Andhra Pradesh |
| 2014               | Nilofar         | 942                    | Gujrat         |

We must take it seriously to save our environment by putting slogan like-

**“SAVE ENVIRONMENT, SECURE OUR LIFE  
 CLEAN ENVIRONMENT, LEAD HEALTHY LIFE  
 PRESERVE PLANTS, NURTURE FUTURE PROGENY”**