# CLIMATE CHANGE - A CHALLENGE FOR SUSTAINABLE DEVELOPMENT

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**"Climate Change Increasingly Poses One of the Biggest Long Term Threats. It is a Collective Endeavors, Its Collective Accountability and its May Not Be Too Late"**

**by –Christine Laggard**

## Introduction:-

Climate change is the most significant challenge to achieving sustainable development, and it threatens to drag millions of people into grinding poverty. At the same time, we have never had better know-how and solutions available to avert the crisis and create opportunities for a better life for people all over the world. Climate change is not just a long-term issue. It is happening today, and it involves uncertainties for policy makers trying to shape the future.

## Major Environmental Issues:-

Some of the major environmental issues that are causing immense concern are environmental pollution, air pollution, water pollution, garbage pollution, noise pollution, deforestation, Ozone Depletion, Greenhouse Effect, climate change etc.

### 1. Ozone Depletion, Greenhouse Effect and Global Warming:-

All the three physical phenomena are related to one another to a great extent. To understand their effect on environment, we must first of all know what their meaning, interrelationship and working is. Near the earth's surface, ozone is an increasingly troublesome pollutant but it is also as important to life as oxygen itself. If this layer disappears or thins, all terrestrial life will be annihilated. The thinning and depletion of the ozone layer has generated global concern during the last few years. This is due to several chemical pollutants discharged by industries and produced through other chemical reactions. The main cause of the ozone depletion is generally attributed to the

chlorofluorocarbons (CFCs) which are mostly produced by highly industrialized developed countries. The depletion of ozone layer is linked to both 'greenhouse effect' and the phenomenon of 'global warming'.

The consequences of global warming are likely to be very overwhelming and disturbing. Among other things, sea levels will rise as a result of melting of glaciers at the poles and the oceans will warm and expand. Cities that lie near the coasts or in low-lying areas will be flooded and become inhabitable. Large tracts of fertile land will become desert. The scientific and technological progress in many ways has improved the quality of human life but at the same time it is also responsible for the depletion of resources, excessive use of fossil fuels, deforestation and desertification, loss of fertility of soil, changes in atmospheric conditions resulting into serious problems like greenhouse effect depletion of ozone layer and global warming.

**2. Desertification:**

There is no environmental problem in the world that affects people, especially poor people, as extensively as land degradation or desertification. UNCOD defines desertification as 'the diminution or destructing of the biological potential of land, which can ultimately led to the desert-like conditions'. The causes of desertification are numerous.

**3. Deforestation:**

Deforestation is one of the important issues of environmental change and degradation of soil. The human pressure on forests has significantly increased in recent decades. The need for agricultural land, increased demand for fuel and commercial wood, more and more dam construction, large-scale ranching and mining along with growing industrialization and urbanization have ruthlessly exploited the forests and have in turn created chaotic conditions and severe environmental imbalances. The main cause of deforestation is commercial exploitation of forests. Besides this, as a part of developmental drive, large dams are constructed across many rivers thereby destroying forests. The forests play a pivotal role in balancing the ecosystem or, in other words, in maintaining the oxygen and carbon balance of the earth. Forests have a multiple

ecological role to play which affects all types of life in a variety of ways.

**4. Loss of Biodiversity:**

Today, the extinction of several species or loss of biodiversity is a much debated issue among the environmentalists at international level. Many species are disappearing rapidly. According to an estimate, 20 to 75 species are becoming extinct each day because of deforestation. This loss of biodiversity is mainly due to the degeneration of life support system. It provides the basis for life on earth. Biodiversity means the variety of life on earth. The diversity is a condition for long-term sustainability of the environment. The maintenance of its integrity is, therefore, recognized as being indispensable to sustain human life. Biological diversity encompasses all species of plants, animals and micro-organisms and the ecosystem and ecological processes of which they are a part. Many species of animals and plants are disappearing rapidly because of their high consumption or destruction. All the species are the integral part of ecosystem and extinctions of some species threatens the balance of ecosystem, and also diminishes the well-being of the remaining species, including human beings. Our earth's biodiversity provides varied sources of food and medicinal plants. The main causes identified for the loss of biological diversity are:-Habitat loss, fragmentation and modification, Overexploitation of resources, Chemical fertilizers, pesticides and oil pollution.

**5. Disposal of Wastes:**

The high energy consumption and high population densities of the urban societies give rise to large quantities of waste water and sewage as well as household rubbish. Industrialization and urbanization are the main causes of domestic, industrial and nuclear wastes. The contaminated water supplies cause many diseases of epidemic nature. The industrial waste consists of chemicals, detergents, metals and synthetic compounds besides the solid waste and garbage. Thousands of tons of mercury, nitrogen, phosphorus, cadmium, lead, zinc and other waste is dumped every day in the river and sea waters. Industrial waste, pesticides and herbicides enter the waterways through dumping as well as runoff from farms and homes. Many rivers of India including the long seashore are the victims of this disposal of waste. Because of dumping of heavy waste, it is now very

difficult to get a cup of totally uncontaminated water from the so-called sacred rivers like Ganga and Yamuna. Inadequate system of solid waste disposal causes adverse impact on health, infant mortality and the birth rate.

**Impact of Climate Change on Water Resources & Hydrologic Cycle**

**Key issues**:-

- Increase in atmospheric water vapor content increased precipitation Key issues
- Change in precipitation patterns increased risk of floods and droughts
- Change in soil moisture and runoff Implications for agriculture and water supply
- Ice melting and reduction in snow cover Change in runoff pattern
- Sea level rise increased seawater intrusion, intrusion, and Coastal population

**Risks of climate change issues:-**

**-Extreme Heat**

India is already experiencing a warming climate. Unusual and extraordinary spells of hot weather are expected to occur far more frequently and cover much larger areas. Under 4°C warming, the west coast and southern India are projected to shift to new, high-temperature climatic regimes with significant impacts on agriculture.

**-Changing Rainfall Patterns**

A decline in monsoon rainfall since the 1950s has already been observed. The frequency of heavy rainfall events has also increased. A 2°C rise in the world's average temperatures will make India's summer monsoon highly unpredictable. An abrupt change in the monsoon could precipitate a major crisis, triggering more frequent droughts as well as greater flooding in large parts of India. India's northwest coast to the south eastern coastal region could see higher than average rainfall. Improvements in hydro-meteorological systems for weather forecasting and the installation of flood warning systems can help people move out of harm's way before a weather-related disaster strikes.

**-Droughts**

Evidence indicates that parts of South Asia have become drier since the 1970s with an increase in the number of droughts. Droughts have major consequences. In 1987 and 2002-2003, droughts affected more than half of India's crop area and led to a huge fall in

crop production. Crop yields are expected to fall significantly because of extreme heat by the 2040s.

**-Groundwater**

More than 60% of India's agriculture is rain-fed, making the country highly dependent on groundwater. Even without climate change, 15% of India's groundwater resources are overexploited. Although it is difficult to predict future ground water levels, falling water tables can be expected to reduce further on account of increasing demand for water from a growing population, more affluent life styles, as well as from the services sector and industry.

**-Glacier Melt**

Glaciers in the northwestern Himalayas and in the Karakoram Range - where westerly winter winds are the major source of moisture - have remained stable or even advanced. On the other hand, most Himalayan glaciers - where a substantial part of the moisture is supplied by the summer monsoon - have been retreating over the past century. At 2.5°C warming, melting glaciers and the loss of snow cover over the Himalayas are expected to threaten the stability and reliability of northern India's primarily glacier-fed rivers, particularly the Indus and the Brahmaputra. The Ganges will be less dependent on melt water due to high annual rainfall downstream during the monsoon season.

**-Sea level rise**

Mumbai has the world's largest population exposed to coastal flooding, with large parts of the city built on reclaimed land, below the high-tide mark. Rapid and unplanned urbanization further increases the risks of sea water intrusion. With India close to the equator, the sub-continent would see much higher rises in sea levels than higher latitudes. Sea-level rise and storm surges would lead to saltwater intrusion in the coastal areas, impacting agriculture, degrading groundwater quality, contaminating drinking water, and possibly causing a rise in diarrhea cases and cholera outbreaks, as the cholera bacterium survives longer in saline water.

**-Agriculture and food security**

Even without climate change, world food prices are expected to increase due to growing

populations and rising incomes, as well as a greater demand for biofuels. Rice: While overall rice yields have increased, rising temperatures with lower rainfall at the end of the growing season have caused a significant loss in India's rice production. Crop diversification, more efficient water use, and improved soil management practices, together with the development of drought-resistant crops can help reduce some of the negative impacts.

**-Energy Security**

Climate-related impacts on water resources can undermine the two dominant forms of power generation in India - hydropower and thermal power generation - both of which depend on adequate water supplies to function effectively. The increasing variability and long-term decreases in river flows can pose a major challenge to hydropower plants and increase the risk of physical damage from landslides, flash floods, glacial lake outbursts, and other climate-related natural disasters. Decreases in the availability of water and increases in temperature will pose major risk factors to thermal power generation.

**-Water Security**

Many parts of India are already experiencing water stress. Even without climate change, satisfying future demand for water will be a major challenge. Urbanization, population growth, economic development, and increasing demand for water from agriculture and industry are likely to aggravate the situation further. Studies have found that the threat to water security is very high over central India, along the mountain ranges of the Western Ghats, and in India's northeastern states. Improvements in irrigation systems, water harvesting techniques, and more-efficient agricultural water management can offset some of these risks.

**-Health**

Climate change is expected to have major health impacts in India- increasing malnutrition and related health disorders such as child stunting - with the poor likely to be affected most severely. Child stunting is projected to increase by 35% by 2050 compared to a scenario without climate change. Malaria and other vector-borne diseases, along with and diarrheal infections which are a major cause of child mortality.

**-Migration and conflict**

South Asia is a hotspot for the migration of people from disaster-affected or degraded areas to other national and international regions. The Indus and the Ganges-Brahmaputra-Meghan Basins are major Trans Boundary Rivers, and increasing demand for water is already leading to tensions among countries over water sharing.

**-Conclusion:-**

**Following are some of the most common solutions to the environmental issue:**

- Replace disposal items with reusable items. The use of paper should be avoided.
- Recycle the waste to conserve natural resources.
- We can protect the ozone layer -Avoid the consumption of gases dangerous to the ozone layer, due to their content or manufacturing process. Minimize the use of cars. Do not use cleaning products that are harmful to the environment and to us. Buy local products.
- Healthy ecosystems and rich biodiversity are fundamental to life on our planet. Botanical gardens are great for biodiversity conservation, as scientists can store, study and grow plants in their native habitats.
- To save electricity- set the air conditioning properly, unplug devices you're not using, inspect your insulation, and reduce large appliance energy waste. Turn off unnecessary lights. To save water- Use the right amount of water. Water plants wisely. Install a low-flow showerhead. Check for and repair leaks. Use a dishwasher.
- Support environmental friendly practices.

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