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Global Environment Issues

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ABSTRACT

Our environment is changing with passage of time and this poses serious hazards to all living beings including the human beings. The human activity is further hastening this environmental change and this is gravely impacting the environmental stability. Therefore, it is very important to understand this change as well as the consequences of this environmental change. Global warming, rapid climate change, loss of biodiversity and ozone layer depletion are some of the important global environment issue that need to be addressed urgently. These environmental issues are just a fraction of a large number of environmental concerns that are threatening the survival of life on earth. These environmental problems are piling up and it is very imperative for the political class of the world to address these various issues efficiently otherwise the doomsday is not far. This review discusses the following important environmental issues, namely, global warming, rapid climate change, loss of biodiversity, human health hazards and ozone layer depletion.

1. Introduction

The environment plays a vital and important role maintaining and improving the health of people and Ecosystems. As the well-managed and healthy soil environment is essential for food production similarly the biodiversity has important role in protecting the humans against infectious diseases. In today's world we are facing a number of problems related to air, water and soil quality degradation, stress on ecosystems, loss of biodiversity, global warming and climate change. Over the years there is increase in global environment instability and it is affecting all mankind and even other forms of life also. There is increasing scientific evidence available that supports the disastrous effect human activity has on the environment. These environmental issues need immediate action so that the mankind can be saved. There is need of innovative scientific action and policies that lead on to new and environment friendly solutions for these pressing problems.

Some of the important environment issues of global significance which are discussed in this chapter are:

1. Ozone layer depletion
2. Global warming and climate change
3. Human health Hazards
4. Loss of Biodiversity

2. Ozone layer depletion

Earth atmosphere comprises of four regions troposphere, stratosphere, mesosphere and thermosphere. It is the upper stratosphere which comprises of light bluish ozone gas layer. It is made of 3 atoms of oxygen. It acts as efficient filter for harmful ultra violet rays coming from the sun. The ozone layer has the unique ability to absorb almost 97-99% of the harmful ultraviolet radiations (wavelength less than 290 nm) of sun and thus protect the living beings including humans from long term devastating effects. This radiation even destroys both the plants and planktons. The reduction in phytoplankton populations will have very harmful effects as it will in turn lower the populations of other animals.

Ozone is formed and destroyed naturally. Recently, we have seen thinning of Ozone layer primarily at the South Pole. Ozone depletion has occurred due to man-made chlorine and bromine compounds like CFCS (Chloro flouro carbons) and other Ozone depleting substances (ODS) which once emitted reach the stratosphere by diffusion. It is the chlorine and bromine atom which destroy the ozone and not the intact molecule. CFCS are released from cleaning agents, coolants in refrigerators, packing material, air conditioning and aerosol spray cans.

In the mid-latitude, for example, over Australia, ozone layer has been found to be thinned out and it has been estimated that about 9% thickness of the ozone layer has decreased in these areas. However, more dangerous trend has been seen in the atmospheric regions over Antarctica where ozone layer is significantly thinned leading to the formation of 'ozone hole'. Ozone layer depletion leads to increase penetration of harmful radiation which causes hazardous effect on human health like eye diseases and skin cancer. It can also alter the species composition and hence change the biodiversity of different ecosystems. These rays can affect the biogeochemical cycles and thus affect both the source and sink of greenhouse and important trace gases like carbon dioxide and carbon mono oxide which can lead to higher rates of photo dissociation. Hence there will be more production and destruction of ozone and other oxidants.

Banning of CFCs in 1996 by the developed countries has been indeed a welcome step and this has led to reduction in the amount of chlorine in the atmosphere. However, scientists estimate that it will probably take another 50 years for chlorine levels to return to their natural levels.

3. Global Warming and Climate change

Climate change is a major concern not only because of flooding, cyclones and other natural disasters that can create havoc, destroy property as well as crops but can have severe adverse impacts on food security and health. After the Industrial revolution the natural composition of the gasses in the atmosphere has got severely affected and the climate had

changed significantly. As Theodore C. Sorensen said "Global warming is for real. Every scientist knows that now, and we are on our way to the destruction of every species on earth, if we don't pay attention and reverse our course". Greenhouse gases like carbon dioxide absorb heat emitted from Earth's surface and thus increases in the concentrations of these gases cause global warming by trapping this heat. Human activities especially the burning of fossil fuels have increased the concentrations by of carbon dioxide tremendously. The average global temperatures are higher than they have ever been and the levels of carbon dioxide in the atmosphere have crossed all previous records. The studies have shown that the past two decades have been the warmest time over past five centuries. The increased global temperatures has resulted in the warming of the oceans, rising of the ocean levels, melting of glaciers and ice in mountains, and decreasing snow cover in the Arctic's. During this century, the climatic disasters have occurred more frequently and these catastrophic events will continue their destruction if urgent steps to decrease global warming are not taken. Continued emissions of greenhouse gases will further exacerbate climate change. Global warming leads on to more warm days and seasons and fewer cold days and seasons as is being recently seen in northern India.

It is expected that the temperature of the earth will rise by 6o ^{o}C by 2100 year due to global warming. Due to rise in temperature there will be rise in sea level and it will cause flooding of low lying areas. Water resources will get affected as the water cycle will change around the world. This will affect the agriculture output and will lead to food shortage and hunger in many parts of the world. The Asian countries and the Pacific region will have more land threats, more economic damage and increased mortality due to rise in sea level than any other part of the world.

The effect of carbon dioxide is not only on temperature but also on the ocean. Carbon dioxide dissolves in water to form a weak acid, and there has been a steady decrease in ocean pH levels due to gradual increase in carbon dioxide absorption by ocean. This acidic pH can lower the growth rates of various species, altering the cycling of nutrients in the ocean.

This convincing evidence on grave effects of global warming has made the world agree that something needed to be done to check climate change. To deal with climate change it will be a costly affair but it will be quite cheaper from not doing anything as it will improve health, economy and environment. Developed countries face biggest responsibility to address climate change as they have emitted far more greenhouse gases than developing countries. The bigger nations should lend helping hands to emerging countries to develop along cleaner energy paths by providing technology transfer, finance and capacity building.

But it is important to understand that even If emissions of carbon dioxide are stopped altogether, it would take many thousands of years for the carbon dioxide levels to return to 'pre-industrial' levels as there is very slow transfer of carbon dioxide to the ocean. Moreover, the temperatures would stay higher for at least a thousand years, and also sea level would continue to rise for many centuries even after temperature stopped increasing. Thus, this carbon dioxide induced warming is essentially irreversible on current timescales and the further warming will depend almost entirely on how much more greenhouse gases we emit. We are at very critical stage and it is a choice that we have to make that whether we change the pattern of energy production and usage in order to decrease emissions of greenhouse gases and hence the magnitude of climate changes or wait for accelerated changes to occur that have potential to wipe humanity from the earth.

4. Human Health Hazards

World has witnessed considerable health gain from last few years as evident from the reduction of childhood mortality and morbidity to the increase in the life expectancy. But the adverse environmental change can play havoc with human health with the emergence and re-emergence of infectious diseases. For example, destruction of natural habitats can reduce the number of natural predators, change the species, or create favourable conditions for disease hosts which will lead to emergence of new infectious diseases. Wide spread deforestation can bring people closer to wildlife and thus leading on to spread of previously unknown diseases to humans like Ebola and Lyme disease. Severe acute respiratory syndrome (SARS), caused by a previously unknown coronavirus (SARS-CoV) which likely had spread from bats to humans, rapidly spread worldwide causing high mortality. This disease is a classic example of human population, economic activities, environmental conditions and air travel together creating a global health threat. Recent outbreak of Zika virus is another example of emergence of new infectious disease.

Biodiversity plays an important role as a buffer by helping in protection against infectious diseases. Many studies have suggested that as biodiversity is lost because of environmental changes, there is an increase in the disease transmission. This effect of biodiversity loss has been reported for various infectious diseases including malaria, Lyme disease, Chagas disease, leishmaniasis and schistosomiasis.

The global warming and consequent climate change has far reaching implications for human health, especially with respect to vector-borne and water-borne infectious diseases such as cholera and dengue. The infectious pathogens and vectors will find a more hospitable environment not only where there are warmer temperatures, but also where there is rising humidity or disaster events are occurring. This will have disastrous consequences as there will be re-emergence of infectious disease that have been eradicated.

Environmental damages have led to the emergence, amplification and spread of new diseases, whereas preservation of ecosystems have an inhibitory effect on disease transmission. Therefore, by ensuring a strong and healthy environment, we can help protect humanity against the devastating impacts of infectious disease.

5. Biodiversity degradation

As John Tuxill and Chris Bright said "Like the dinosaurs 65 million years ago, humanity now finds itself in the midst of a mass extinction: a global evolutionary convulsion with few parallels in the entire history of life. But unlike the dinosaurs, we are not simply the contemporaries of a mass extinction - we are the reason for it." Biodiversity is variety of life forms on the earth and the interdependence of all living things. It is the linkage among organisms and their physical and biological environment constituting an interacting and ever-changing system called ecosystem. Biodiversity provide numerous services which are assets for human wellbeing. Biodiversity boost the ecosystem services, where all types of species whether big or small have an important role to play in each

other's survival. Human being dominate earth and therefore it becomes more important for us to preserve and conserve the wildlife diversity. Yet the greed and power of man has affected the delicate balance of nature and there is continuous loss of biodiversity.

Human activity has profound effect on the climate of the earth and it is predicted that there is a link between the loss of biodiversity and the climate change. Species most threatened by climate changes are one having small range of survival, low populations densities, and limited habitat requirement. For example increase global warming is corroding the coral reefs by impacting the calcification (coral building process) and the loss of Arctic sea ice has led to loss of many marine as well as terrestrial animals and plants. The sea level is also rising that will eventually engulf low lying areas and cause extinction of many endemic island species. The climate change can lead to the invasion of exotic species which can outcompete the native wild life. Draught and wildlife fires will increase, which will further lead to more warming and drying out of vegetation. The climate change may change the competitive balance between the different species and this could lead to loss of forest ecosystem. T*he* **future** *of biodiversity determines the future of* **humanity.**

6. Conclusions:

The human activity hastening the environmental change as well as damage and this is gravely impacting the stability and causing drastic climate changes and loss of biodiversity. In view of the potential of catastrophic environmental damage caused by human development, a comprehensive and affirmative joint action is required by both developed and undeveloped world to incorporate sustainable development for achieving goals like economic security and prosperity of people, development and social advancement as well as the environmental sustainability. If we do not act now, it will be very late and the humanity will be wiped out!

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