European Journal of Business & Social Sciences
Available at https://ejbss.org/
ISSN: 2235-767X
Volume 06 Issue 08
August 2018

A Study On Consequences Of Depletion Of Ozone Layer

Deepak
M.sc geography
Ugc - Net JRF

ABSTRACT

Ozone layer plays an important role in protecting the earth from the harmful ultra-violet rays coming from the sun. The ultra-violet rays of the sun are very dangerous as these rays have the tendency to raise the temperature of the earth very quickly. Before reaching the ultra-violet rays on the surface of the earth, these rays have to pass through the ozone layer in the atmosphere.

But, from past few years, it is observed that the depletion in the ozone layer is found and therefore, the capability of ozone layer to absorb the harmful ultra-violet rays of the sun is decreasing year by year. Due to this depletion in the ozone layer, higher percentage of sun's ultra-violet rays are coming on the surface of the earth and the temperature of the earth is increasing. Due to this increase in the temperature, the situation of global warming has raised all over the world. The current paper highlights the consequences of depletion of ozone layer.

ISSN: 2235-767X
Volume 06 Issue 08
August 2018

KEYWORDS:

Ozone, Depletion, Atmosphere, Ultra-violet

INTRODUCTION

Ozone layer has the capability to absorb the much percentage of these ultra-violet rays of the sun. After passing through the ozone layer, these rays fall on the surface of the earth. It is said that if there were no ozone layer between the sun and the earth then the temperature of the earth would have been so much that it would be impossible for the people to live on this planet.

Hence, it can be said that we are living on the earth comfortably due to the presence of the ozone layer in the atmosphere as this layer absorbs a good percentage of ultra-violet rays coming out from the sun. Ozone layer is like a protecting layer which shields earth against the ultra-violet rays of the sun.

A big hole is seen in the ozone layer by the scientists and it is reported that the temperature of the earth is increasing due to this big hole as huge percentage of ultra-violet rays is falling onto the earth and the capability of the ozone layer is also reducing due to this depletion in this layer.

Due to increase in the temperature, the glaciars are melting down quickly and hence, the water level in the oceans and sea is increased year by year. If this situation is not controlled then it would result into a big disaster onto the earth as all the natural resources would be destroyed due to global warming.

ISSN: 2235-767X
Volume 06 Issue 08
August 2018

The results have been started to show where in a number of countries it is found that the average temperature has increased over the years. Due to this increase in the temperature, the living organisms are facing a lot of problems.

The impact of global warming can also be seen among the flora and fauna as it is observed that a number of species of plants and birds, animals have destroyed due to this increase in the temperature. In some cases, it is found that a number of lakes and ponds have dried due to global warming.

The major causes of this depletion in the ozone layer are air pollution and harmful gases releasing from refrigerators, air-conditioners and factories. It is observed that a number of harmful gases like Nitogen, Carbon, Sulphur and Carbon Di-oxide etc. are mixed into the earth's atmosphere and consequently, these gases reach to the ozone layer and tend to decompose it.

Hence, a big hole has been created in the ozone layer which is causing global warming on the earth. Here, it can be said that the living persons of the earth are responsible for this depletion of ozone layer as we are running after the more and more development and while doing so, we have ignored to preserve the atmosphere and hence, now we are facing a very huge problem of global warming.

ISSN: 2235-767X
Volume 06 Issue 08
August 2018

This problem of global warming due to the depletion of the ozone layer is so challenging that if it is not controlled on time then the existence of life would be a nightmare on this planet.

CONSEQUENCES OF DEPLETION OF OZONE LAYER

Effects on Human Health

Ozone layer depletion increases the amount of UVB that reaches the Earth's surface. Laboratory and epidemiological studies demonstrate that UVB causes non-melanoma skin cancer and plays a major role in malignant melanoma development. In addition, UVB has been linked to the development of cataracts, a clouding of the eye's lens.

Because all sunlight contains some UVB, even with normal stratospheric ozone levels, it is always important to protect your skin and eyes from the sun. See a more detailed explanation of health effects linked to UVB exposure.

EPA uses the Atmospheric and Health Effects Framework model to estimate the health benefits of stronger ozone layer protection under the Montreal Protocol. Updated information on the benefits of EPA's efforts to address ozone layer depletion is available in a 2015 report, Updating Ozone Calculations and Emissions Profiles for Use in the Atmospheric and Health Effects Framework Model.

ISSN: 2235-767X
Volume 06 Issue 08
August 2018

Effects on Plants

UVB radiation affects the physiological and developmental processes of plants. Despite mechanisms to reduce or repair these effects and an ability to adapt to increased levels of UVB, plant growth can be directly affected by UVB radiation.

Indirect changes caused by UVB (such as changes in plant form, how nutrients are distributed within the plant, timing of developmental phases and secondary metabolism) may be equally or sometimes more important than damaging effects of UVB. These changes can have important implications for plant competitive balance, herbivory, plant diseases, and biogeochemical cycles.

Effects on Marine Ecosystems

Phytoplankton form the foundation of aquatic food webs. Phytoplankton productivity is limited to the euphotic zone, the upper layer of the water column in which there is sufficient sunlight to support net productivity. Exposure to solar UVB radiation has been shown to affect both orientation and motility in phytoplankton, resulting in reduced survival rates for these organisms. Scientists have demonstrated a direct reduction in phytoplankton production due to ozone depletion-related increases in UVB.

UVB radiation has been found to cause damage to early developmental stages of fish, shrimp, crab, amphibians, and other marine animals. The most severe effects are decreased reproductive

ISSN: 2235-767X
Volume 06 Issue 08
August 2018

capacity and impaired larval development. Small increases in UVB exposure could result in population reductions for small marine organisms with implications for the whole marine food chain.

Effects on Biogeochemical Cycles

Increases in UVB radiation could affect terrestrial and aquatic biogeochemical cycles, thus altering both sources and sinks of greenhouse and chemically important trace gases (e.g., carbon dioxide, carbon monoxide, carbonyl sulfide, ozone, and possibly other gases). These potential changes would contribute to biosphere-atmosphere feedbacks that mitigate or amplify the atmospheric concentrations of these gases.

Effects on Materials

Synthetic polymers, naturally occurring biopolymers, as well as some other materials of commercial interest are adversely affected by UVB radiation. Today's materials are somewhat protected from UVB by special additives. Yet, increases in UVB levels will accelerate their breakdown, limiting the length of time for which they are useful outdoors.

The most famous example is aerosol cans. Chemicals used as propellant in aerosol cans react with ozone and break it down. This causes ozone depletion. Ozone naturally absorbs UV from the sun, making the earth more resistant against solar flares and everyday UV radiation. Worst case scenario, if we have no ozone left and a solar

ISSN: 2235-767X
Volume 06 Issue 08
August 2018

flare strikes earth, it would be much more damaging than if we had the ozone there to soak up some of the UV.

DISCUSSION

UV-B rays negatively affect plants, including crops humans rely on. An increase in UV-B rays can mean smaller leaf size, decreased plant growth, and lower quality crops for humans. Plants form the basis for most food chains, thus negative effects would likely cascade to those organisms relying on them. Plants are also very important in terms of respiration, photosynthesis, soil stability, and a decline in plant productivity/reduced plant growth would potentially affect soil erosion and productivity and the carbon cycle.

Phytoplankton and zooplankton are very sensitive to the amount of light in their environment, and increases in UV-B rays would greatly affect them. Because these organisms are the base of the food chain, declines in their numbers would likely have wide-reaching effects for all marine life.

Chlorofluorocarbon (CFCs), halons and other compounds deplete the ozone layer. These chemicals are found in cleaning agents, aerosols, insulating foam, and refrigerants. CFCs and halons break down into chlorine and bromine which in turn destroy the ozone layer.

A vital factor in this process is the presence of clouds of particles that serve as the site upon which the chlorine-releasing reactions take

ISSN: 2235-767X
Volume 06 Issue 08
August 2018

place. This function is usually served by polar stratospheric clouds, but the composition of the particles is unimportant. This explains the impact of volcanic eruptions such as that of Mount Pinatubo on stratospheric ozone depletion. Such eruptions provide a profusion of aerosol particles upon which reactions releasing chlorine can occur.

The significance of low temperatures to ozone destruction also explains why ozone depletion is less advanced in the Arctic. The Arctic stratosphere doesn't get as cold as air over Antarctica. This is partly due to different wind patterns, influenced by mountain ranges in the northern hemisphere.

This partial protection of the northern ozone layer is under threat, however, from the greenhouse effect. John Gribbin reported in the *New Scientist* of November 28, 1992, that researchers have predicted that the lower stratosphere will cool significantly in coming decades and lead to the appearance of an Arctic ozone hole. Carbon dioxide and other greenhouse gases trap heat closer to the earth's surface. This warms the lower atmosphere, but robs the stratosphere of warmth. This in turn will create the conditions to release chlorine in its ozone-destroying form.

The circumstances upon which the viability of the ozone layer depends are also threatened by another factor. The loss of ozone from the stratosphere means that it is not there to absorb ultraviolet light

ISSN: 2235-767X
Volume 06 Issue 08
August 2018

from the sun. This also leads to a cooling of the stratosphere, further facilitating the release of chlorine and the destruction of ozone.

The problem of ozone depletion thus threatens to get even more out of hand than it is already, and the risks it poses can't all be dealt with by a bottle of sun block and a wide-brimmed hat. Not only does ozone depletion threaten human life through increased incidence of skin cancer. Increased ultraviolet rays as a result of ozone destruction will also damage crops and threaten the basis of the marine food chain, by killing off the phytoplankton that live near the ocean's surface.

CONCLUSION

The lessons to be drawn from this brief look at ozone depletion are that the problem is too serious and too complex to take chances with. The processes we're dealing with require urgent measures to *prevent* further damage: humanity doesn't have the capacity to repair the sort of global ecological disaster that is looming.

With our environmental security at stake, it is far better to err on the side of minimizing our impact on the ozone layer, rather than constantly being surprised that the situation is much more serious than previously thought. If governments are unwilling to adopt this attitude, we will have to pressure them to do so, or replace them with governments that will.

REFERENCES

1. Buchholz R., Paton-Walsh C., Griffith D., Kubistin D., Caldow C., Fisher J. Source and meteorological influences on air quality (CO, CH4 & CO2) at a Southern Hemisphere urban site. Atmos. Environ. 2016:274–289.

2. Comisión Europea . 1999. A Common Position for a Revised Council Regulation on Substances that Deplete the Ozone Layer 5748/99. Diario Oficial C123/03.

3. Solís-Molina M., Martinez S.A., De Mendoza A., Cabal Hincapie R. Elaboración de un producto a partir de plástico reciclado. Informador Técnico. Dec. 2001;63:35.

4. Martínez Flores K., Souza Arroyo V., Bucio Ortiz L., Gómez Quiroz L., Gutiérrez Ruiz M. Cadmio: efectos sobre la salud. Respuesta celular y molecular. Acta Toxicol. Argent. 2013:33–49. http://ppct.caicyt.gov.ar/index.php/ata/article/view/2950

5. Sánchez-Monedero M., Serramiá N., Civantos C., Fernández-Hernández A., Roig A. Greenhouse gas emissions during composting of two-phase olive mill wastes with different agroindustrial by-products. ScienceDirect. 2010;18–25 Obtenido de.

6. Royer S., Ferrón S., Wilson S., David K. Production of methane and ethylene from plastic in the environment. PLoS One. 2018 Obtenido de.