



## PATEL'S VIEW OF OZONE DEPLETION AND SOLUTION

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### **Abstract**

*Ozone depletion occurs at stratosphere due to deficiency of oxygen in troposphere caused due population explosion and deforestation. On status of 2020 AD, 7 trillion gallon more ozone convert into oxygen per day due to population explosion. 6 trillion gallon oxygen production by plants reduced due to deforestation because global forest lost of 1.5 billion hectare land. On average 100 gallon oxygen is consumed by a person per day. Human population was 1 billion in 1800 and about 8 billion in 2020. Trees plantation on 2 billion hectare area will produce about 8 trillion gallon additional O<sub>2</sub> per day that will balance ozone depletion because oxygen is convertible into ozone under the Sunlight. As an equation: Ozone depletion (OD) = Population explosion (PE) + Net deforestation (ND).*

**Key Words:** *Population, Explosion, Deforestation, Deficiency, Oxygen, Ozone, Breakdown, UV.*

### **Introduction**

That about 90% of ozone (O<sub>3</sub>) gas is naturally present in stratosphere layer of atmosphere of the Earth (1, csl.). Ozone molecule (O<sub>3</sub>) can breakdown into oxygen molecule (O<sub>2</sub>) and oxygen atom / nascent oxygen (O) by Chlorine and Bromine molecules which act as catalyst consequence is depletion of ozone layer at stratosphere (2, csl). Breaking down of ozone into oxygen molecule and atom I a reversible reaction at atmosphere under the Sunlight particularly UV radiation (3, cimss). Human population of the globe has extremely increased in last a couple of century that was 1 billion in 1800 and 7.9 billion in 2020 AD (4, wiki). On an average a human being consumes about 100 gallon (378 litres) of pure oxygen per day (5, Kahn). 300-400 plants are required to fulfil daily requirement of oxygen of a person per day (6, Ugao). In general practice around 1600 trees could be planted in an area of 1 hectare (7, NHS). The world has lost about 1.5 billion hectare forests during 1700 to 2020 Ad in about 300 year (8, Our). Oxygen is 21% in troposphere the lowest layer of atmosphere adjacent below to stratosphere (9, home). Life time of Chlorofluorocarbons (CFCs) source of Chlorine in atmosphere is about 55 years for CFC-11, and 140 years for CFC-12 and CCl<sub>2</sub>F<sub>2</sub> (10, gml), thereafter these pollutant automatically degrade in the atmosphere. This reaction might have begun in stratosphere.

### **Materials and Method**

Relevant material / research papers / matter downloaded from Google search box, read and references noted down instantly. Reference number and one word of each reference were written in text within bracket in introductory chapter. This work is only theoretical, all references were seen online.

### **Result and Discusions**

Human beings consume oxygen of atmosphere during process of respiration and oxidation of food materials takes place to generate energy in the form of ATP which is utilized in various metabolisms. The amount of Oxygen is definite 21% in troposphere layer of atmosphere. Human population has increased extremely from 1 billion in 1800 AD to about 8 billion in 2020 AD. Correspondingly human oxygen demand (HOD) also has increased about 7 time more. Deficiency of Oxygen in troposphere is fulfilled by breakdown of Ozone of stratosphere in presence of the Sunlight / UV radiation. That is



Oxygen and Ozone is convertible into each other. Chlorine molecules released from Chlorofluorocarbons (CFCs) by effect of Ultra Violet (UV) radiations and act as catalyst. 1 molecule of Chlorine is capable to breakdown 100000 molecules of Ozone into Oxygen molecule and nascent oxygen. Ozone of stratosphere works a source of Oxygen whereas human population works a sink of oxygen. Depletion of Ozone in stratosphere takes place to maintain Oxygen of 21% in troposphere of atmosphere. Since, stratosphere is just above and adjacent to troposphere where Oxygen is consumed by human beings resulting lowering Oxygen level less than 21%. Any deficiency of Oxygen in troposphere wherein human beings are residing is fulfilled by Ozone of stratosphere. Utilisation of Oxygen by human beings was only 1 trillion gallon per day at rate of 100 gallon per person per day in 1800 AD, whereas 8 trillion gallon in 2020 AD. That is, 7 trillion more ( $100 \times 7 = 700$ ) Oxygen was consumed in 2020 AD in comparison to 1 trillion in 1800 AD. Roughly, 7 trillion gallon more Ozone depletion occurs per day at status of 2020 AD which is a matter of concern.

Green plants produce Oxygen during photosynthesis which are source of Oxygen in troposphere whereas Ozone in stratosphere is sink. Global forests a enormous source of Oxygen have become a bit weak source of Oxygen due to excessive deforestation in a few back centuries 1700 – 2020. On an average about 400 (four hundred) trees fulfil daily Oxygen requirement of 100 gallon of a person. Normally 1600 (sixteen hundred) tree could be planted in an area of 1 hectare (one hectare). A big deforestation of 1.5 (one point five) billion hectare area has been during 1700 to 2020 AD. Tree of 1 (one) hectare area fulfil requirement of 4 (four) persons per day at the rate of 100 gallon per person per day. That is forest of 1 hectare area fulfil requirement of 4 persons per day. Hence, forests of 1.5 billion hectare could fulfil requirement of 6 (six) billion persons ( $1.5 \times 4 = 6$ ) per day. That is 6 trillion gallon Oxygen production by forests decreased due to deforestation of 1.5 billion hectare area. If, present generation of human beings manage reforestations on 2 (two) billion hectare area then Oxygen production will increase 8 (eight) trillion gallon per day which could fulfil daily consumption of Oxygen of about 8 trillion gallon of about 8 billion persons. Ozone depletion problem created by human population explosion and deforestation could be solved by plants population explosion in about 50 (fifty) years, that is by 2075 AD. Ozone depletion may be formulated as:  $Ozone\ Depletion\ (OD) = Population\ Explosion\ (PE) + Net\ Deforestation\ (NF)$ .

Effect of Chlorine as a catalyst and pollutant could be nil because Ozone degradation is reversible reaction. Whatever Ozone depletion is, it is due to population explosion and deforestation not by chlorofluorocarbons (CFCs) pollution. Moreover, life time of CFCs in atmosphere is merely 55 (fifty five) years for CFC-11 and 140 years for CFC-12 and  $CCl_2F_2$ . Therefore, auto degradations of Chlorine might have begun in atmosphere.

### Conclusion

Ozone depletion is due to human population explosion and deforestation. Human oxygen demand has increases 7 trillion gallon per day in last 2 centuries on situation of 2020 AD. On the other hand oxygen of oxygen decreased 6 trillion gallon per day owing to deforestation on 1.5 billion hectare global forests. Role of CFCs may be nil because  $O_3$  naturally converts into  $O_2$  and  $O$  vice versa under solar radiation / UV radiations in the atmosphere. Forestation and reforestation on additional 2 billion hectare area will solve problem of ozone depletion due to enough production of Oxygen in the atmosphere to form Ozone.



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