

# Problems & Prospects due to Ozone Layer Depletion & Climate Change in Nigeria

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## ABSTRACT

There is a widespread concern that the Ozone layer which is bringing out terrible deterioration thus contributes to climatic change global warming. So Nigerians are facing a serious global environmental problem. The objective of this paper is to review & examine how Ozone layer depletion & climate change acts as a threat to Nigerians and strategies that should be elucidated to reduce this phenomenon. The review established the fact that climate change has adverse effect in Nigeria especially in gas flaring region, Nigeria Delta area. Nigeria generally is known as a highly industrialized country and a recent study reports that Nigeria have over one hundred and twenty three (123) gas flaring sites making her one of the highest emitters greenhouse gases in Africa. The World Bank (2008) revealed that Nigeria accounts for roughly one-sixth of the worldwide gas flaring. There are sparse rainfall thereby making food production difficult in Northern part of Nigeria.

## 1. Introduction

Modern human are the culprit of the Earth's degradation due to uncontrolled consumption pattern of natural resources because of the quest for human survival, improved quality of live. There are also industrial advancement in Agriculture, Science & Technology, all these unmistakably altered some essential natural processes and systems on the earth. The emissions of greenhouse gases as byproducts have been inducing global warming over the centuries and have now resulted to anthropogenic climate change. Ozone depletion & Climate Change have usually been throughout of environmental issues with little in common other than their global scope.

The Ozone layer has been linked to climate change in several studies but it is a different phenomenon. The Ozone is a layer of gas present in the upper part of the atmosphere which is about 20-48 Km above the sea level. It contains structurally different forms of oxygen constantly reacting in the presence of UV radiation allowing non-harmful radiations to pass. Since this layer contains gases in reaction, these gases are powerfully anthropogenic in nature and are chemically stable in the atmosphere.

The most obvious linkage between efforts to mitigate Ozone depletion and climate change is the fact that certain ODS (CFCS and HCFCs) are also powerful greenhouse gases that alter some processes in the atmosphere. Once the CFCS were exposed to UV radiation, free Chlorine were liberated, a substance that is very reactive indeed, which enhance both global warming and stratospheric Ozone depletion. It is important to know that the global climate system also involves in addition to the atmosphere, the oceans and other surface waters, the world of ice masses, surface soil and vegetation and geographical features of the earth.

## 2. Climate change and global warming

Climate change and global warming are often used interchangeably. It is referred to a change which is directly and

indirectly attributed to human anthropogenic activities that alters the composition of the global atmosphere and which are in addition to natural climate variably observed over-comparable period of time. When there are natural disorders in the Ozone layer either due to human or non-human factors, there will definitely be climate change. Over some decades now, the issue of global climate change due to greenhouse effects poses threat to human, natural systems and resources through high temperature, acidic rain, flooding and susceptibility to pests and diseases outbreak hence making life difficult to live.

Anthropogenic activities such as the burning of coal, oil and natural gas as well as deforestation and various industrial practices are altering the composition of the atmosphere and contributing to climate change.

Global warming is increased in the average temperature of planet earth's atmosphere. This comes from the release of CO<sub>2</sub> and other greenhouse gases such as CH<sub>4</sub>, N<sub>2</sub>O, CO and H<sub>2</sub>O into the atmosphere.

## 3. Ozone layer depletion

The Ozone is a stratospheric layer, which plays an important role in the support of human lives for survival. Ozone layer is present in an upper part of the atmosphere which is about 20-48 Km above the sea level. It contains different forms of oxygen constantly reacting in the presence of UV light. Ozone layer protects planet earth from harmful UV radiation allowing non-harmful UV rays to penetrate to the earth surface.

Ozone would still be present near the surface and throughout the troposphere and stratosphere because it is a natural component of the clean atmosphere but when it is massively affected and reduce in amount, it leads to depletion of Ozone layer and subsequently lead to climate change and global warming. The large amount of ODSs (Ozone Depleting Substance) released into the atmosphere has led to a significant decrease of the Ozone layer. CFCs, HFCs, HCFCs,

BFCs and halocarbons which are artificially synthesized gases consisting of Carbon and one or more halogens released in enormous amount thereby responsible concentration of Cl and Br in the atmosphere. The studies indicted that the Ozone layer is becoming thinner and thinner thereby decreasing in its capability and potency of both acting as a blanket shielding the earth surface from UV radiations as well as acting as a filter to lethal rays from to part of the earth that supports life. Ozone layer depletion is majority caused by greenhouse gases like CFCs, Volatile organic compounds, SO<sub>2</sub>, NO<sub>2</sub>, CO<sub>2</sub>, CH<sub>4</sub>, water vapour etc.

**4. Nigeria as a case study**

The climate change and sea level rise have significant impacts regionally and locally creating problems for human resources management and affecting the sustainability of the environment and seal level rise.

It is important to mention a few things about the Niger Delta area, the main origin of petroleum resources in which Niger economy substantially depends. As noted by Ojo with rise of one meter in seal level, for example, inundation in the Niger Delta alone may render more than 15,000 Km<sup>2</sup> of land at risk, while soil erosion may claim more than 300 Km<sup>2</sup> with sea level rise of 0.3 meters, the land loss due to inundation may exceeds 7,000 Km<sup>2</sup> while that due to erosion may be upto 120 Km<sup>2</sup> and if this happens about 2-3 million people could be displaced in the Niger Delta State of Nigeria. It has also been estimated that along the coastline of Niger Delta alone about 110 villages with values of 35 billion USD and about 500 villages with values worth of 175 million USD would be impacted with a sea level rise of about 0.2 and 1.0 million respectively.

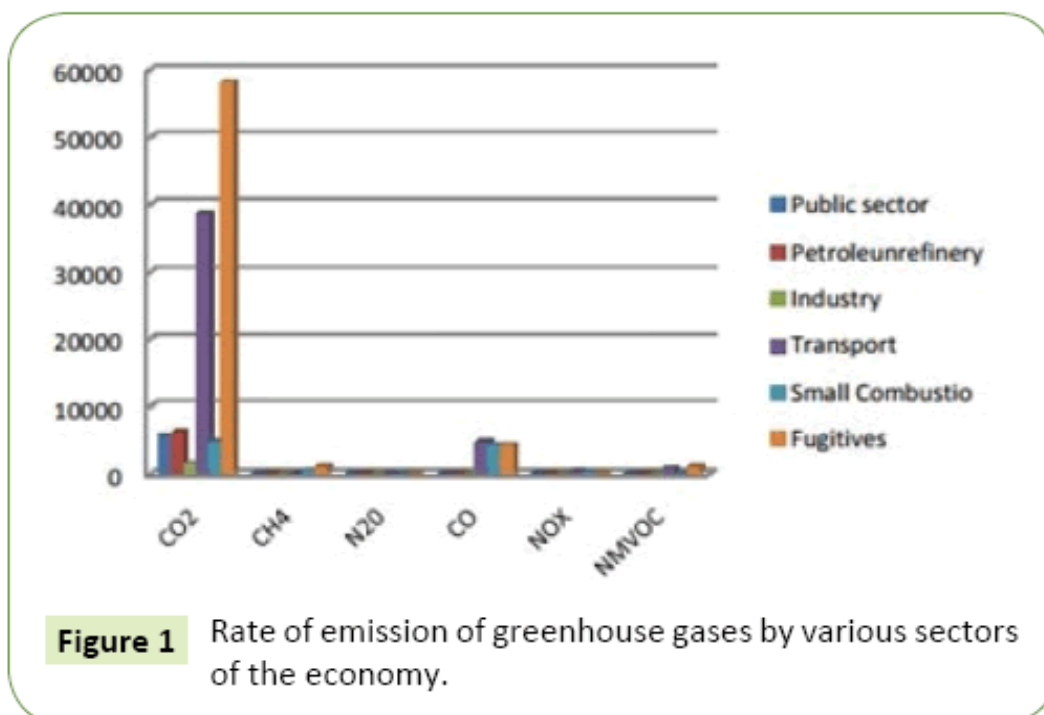
Indeed, the entire municipality of Port Harcourt (about 70 Km<sup>2</sup>) may be inundated. Other significant localities that may be

affected are Warri, Okrika, Nichia, Abua, Bori, Bonny, Degema, Brass and Yenogua, all of which are local government headquarter.

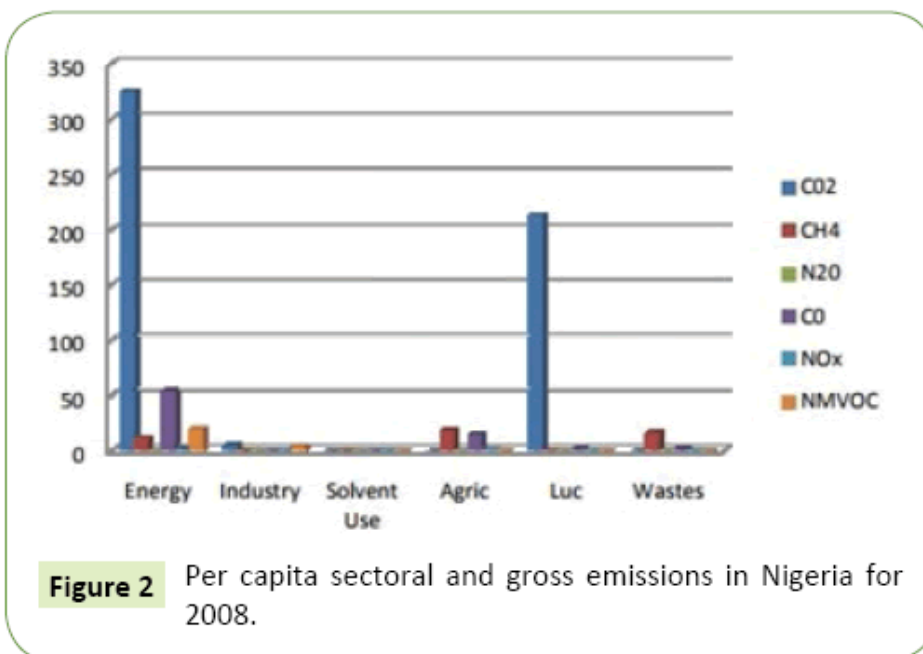
Another likely consequence of the effect of climate change and sea level rise on the water supply demands system in Lagos State Metropolitan area for example, the impacts of climate change will cause rise in the sea level thereby would include damages and losses due to erosion, inundations, flood, salt level rise on ground H<sub>2</sub>O resources in the area. It can also lead to loss of vegetation and possible displacement of people. Another likely consequence of the effect of climate change and sea level rise on water resource systems in the Lagos area is the possible alteration of the characteristics of the hydrological systems with serious consequences on the availability of water resources in the area. Already more half of the population in the metropolis could be subjected to further stress as a result of the likely negatives impacts of climate change and rise in sea level on ground water resources in the area.

Lagos State consists of large areas of low land vulnerable to rise in sea level. This is particularly so because the State is generally characterized by low lying area below 5 meters. The summary of the study shows that if adequate response measures are not taken, considerable physical, ecological and socio-economic losses would be incurred with the expected rise in seal level between 0.5 meter and 1.0 meter in areas like Eti-osa, Lekki, Lagos Island, Shomolu Ojo and Badagry areas will be inundated.

Nigeria contributes significantly to the greenhouse emissions especially land use change and forestry sector generated about 40% of gross emissions into the atmosphere. Also sources of CO<sub>2</sub> emission are gas flaring and transportation which accounts for 20% and 30% respectively. (Figures 1 and 2)



**Figure 1** Rate of emission of greenhouse gases by various sectors of the economy.



## 5. Conclusion

Since humanity is altering the concentration of these greenhouse gases and aerosols, both of which influence and are influenced by climate, it has become very significant to balance the forces that determine the earth climate making it a home for humanity. The environmental problems that have arisen in Nigeria need a preliminary measure to prevent future damages to Ozone layer. All Stakeholder needs to have high

level of awareness on the adverse impact of climate on all fact of our living.

However, it will be beneficial if Nigerians focuses more attention on environmental friendly chemicals for industrialization and household uses like refrigerant, aerosol etc. that will reduce the problem of Ozone layer depletion and safe the future of planet earth and mankind. Since, climate change is a product of greenhouse gases unlike CFCs (Ozone depleting substances) and most of them are not synthetic.

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