

## Demographic Change and Climate Change: The Nigerian Experience

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### ABSTRACT

In recent time, there has arisen increasing concern about the effects of climate change in the tropical environment, Nigeria inclusive. This concern has prompted a range of researches into the causes and the effects of climate change as well as the possible mitigation measures that can be adopted. This paper examines the imprint Demographic change on Climate change in Nigeria. Sustained population increase as obtained from available demographic records implies a sustained increase in human activities which has resulted into population pressure. The pressure exerted on the resources of any geographic region manifests itself in one form of environmental problem or the other, climate change inclusive. The broad objective of this paper is to establish a link between demographic change and climate change in Nigeria. The specific objectives include; identifying the various human activities going on the different parts of the country and how they contribute to climate change, as well as highlighting some of the effects of Climate change in Nigeria. The method employed is fundamentally descriptive. The findings are that human factors are the causes of climate change in Nigeria as opposed to natural causes. Such factors include : population growth and the resultant population pressure; agricultural practices; deforestation; Urbanization; oil extraction activities and gas flaring in the Niger Delta region, increasing numbers of automobiles with the attendant air pollution and indiscriminate dumping of wastes. The paper also made recommendations on how to limit population growth and how to mitigate the effects of climate change in Nigeria.

**Key words:** Demographic Change; Population Pressure; Human Activities; Greenhouse gas, Climate Change

### Introduction

There has been increasing concern by the government and the public about the adverse effects of Climate change on man and environment in. Climate change and global warming which are as a result of greenhouse gas emission are among the greatest environmental challenge facing mankind today. The United Nations Framework Convention on Climate Change (UNFCCC) defines Climate change as “a change in climate which is attributable directly or indirectly to human activities that alter the composition of global atmosphere and which are in addition to natural variability observed over a considerable time periods”. The UNFCCC thus makes a distinction between climate change attributable to human activities altering the atmospheric composition, and climate variability attributable to natural causes (IPCC 2001). Predictions are that climate change will have both positive and negative effects, but that the negative effects will exceed with greater rate of climate change. The effect of climate change according to (IPCC 2001) will manifest as more hot days and heat waves, fewer cold days and cold waves, a change in global precipitation events, and the destructions of ecosystems, entire species and bio-diversity.

Globally, climate change results from both natural and human factors. While natural factors include events like continental drift, volcanic eruptions, earth drift among others, the human causes include various human activities associated with population growth and its attendant population pressure, urbanization, gas flaring, mechanized lifestyles which has occasioned constant emission of greenhouse gases at a rate which alters the natural composition atmospheric greenhouse gases (Guinness and Nagle 2006, Odjugo 2011, Efe 2011) Increasing human activities is basically a function of rapid and sustained population growth. The world population is currently estimated at seven billion with an annual growth rate of 1.99%. As the population grows, contribution to global emissions grows. Therefore population size and growth rates have become significant factors in magnifying the impacts of global climate change.

The world population growth touches practically all specific ways that human beings and the environment interrelate. These include: agriculture and forest, Ocean, minerals, energy and urban growth. Beyond these, population growth also contribute to environmental changes affecting the earth as a whole, this include, climate change. Although Climate change is a global issue, yet there is the need to identify the various ways through which increase in human activities due to rapid and sustained population growth at regional and national levels contribute to the total volume of greenhouse gas in the atmosphere. Hence this paper examines the impact of Demographic change on Climate change based on the Nigerian experience as its major goal.

Theoretical framework.

The Malthusian Theory of Population growth is hereby discussed as it relates to Nigeria's situation. Thomas Robert Malthus, who is often referred to as the first professional Demographer in his seminar Work titled "An Essay on the Principle of Population" which was published in 1798 brought together facts of life regarding the effects of rapid population growth which have both, social, economic and environmental implications. Malthus theory reflect three distinct propositions viz causes of population growth, consequences of population growth and avoiding the consequences of population growth.

Regarding the causes of population growth, Malthus identified the interesting biological urge for sex which ultimately leads to reproduction. He posited that if this urge to reproduced is unchecked, it would result into a situation where man will outgrow the possibility of an adequate supply of food in a limited territory. Malthus opined that whereas the human population when unchecked increases in a geometrical proportions (2,4,8,16,32...), the means of subsistence i.e. food supply grows at a much more slower arithmetic progression (1,2,3,4,5...). Malthus made this assertion because he felt that an increase in food supply was achieved by bringing more land into arable production, this is quite logical. The consequence of population growth outstripping food supply is that catastrophe will occur in the form of famine, disease and war. These predicted social and environmental disasters will occur as humans fight and exact pressure on the resources of the environment.

On how to avoid the consequences of rapid population growth, Malthus proposed two checks. The Positive and the Preventive checks. The Positive checks include those associated with extreme agony and discomfort when they operate, such as Epidemics, famine, war etc. The Preventive checks on the other hand places more emphasis on moral restraint as an important factor of population control and regulation. Although Malthus has been criticized on several grounds, yet Nigeria's population-development scenario tend to support the pessimism of Malthus as unrestrained population growth has variously been identified as the principal cause of poverty, malnutrition, environmental disruptions and other social problems (Onokerhoraye1993; Umoh 2001;Osirike 2011).

In Nigeria, the Malthusian theory cannot be completely ignored so as not to remain perpetual victims of the Positive check. With a national annual growth rate of 3.2% the situation is worse than in Europe's rapid population growth rate of a little higher than 1%. Yet at that time of Europe's rapid population growth, her agricultural production was progressing well and overall development in environment sanitation, food production, nutritional and industrial development accounted for and supported much of the change (Isiugho-Abanihe1994). In Nigeria, while population growth is on the increase, agricultural production has declined to the extent that large proportion of budgeting allocation goes into food importation, per capital income is low and industrial development is stagnant (Umoh 2001).

Given the above situation, one can say that population growth in Nigeria if unchecked can outstrip resource leading to population pressure. This can lead to Malthus predicted social, economic and environmental disaster attributable to rapid population increase.

Demographic Change and Climate Change in Nigeria

Demography is the study of population, including the characteristics and composition of a population, growth trends, and predictions concerning anticipated changes. Demography is also defined as the statistical explanation of human population particularly with regards to their size, structure, growth and development(Olomo and Sajini 2011). Nigeria's demographic history revealed that the country's population has grown from a total figure 30.42 million in 1952/53 to 56.66 million in 1963, it further rose to 79.76 million in 1973, 88.99 million in 1991 and 140.43 million in 2006 ( FRN official gazette 2007; NPC 2008).

This persistent demographic change in the country result from interplay of many factors. The most prominent of this factors is the declining death rate as against the presently high birth rate leading to a high natural increase. Death rate in Nigeria is estimated at 13/1000 while birth rate is 40/1000 (CIA World fact book 2012; NPC 2005). Some other reason's advanced for explaining the seemingly "low" mortality rate in Nigeria include better medical care and the benefit of scientific breakthrough in techniques for controlling infectious diseases, improved agriculture and enhanced food security, better nutrition are improvement in general sanitation among Nigerians (Umoh 2001; Onokerhoraye 1993)

The concept of climate change on the other hand, portrays a socio- environmental problem that resulted from the emission of greenhouse gases. This emission has been attributed to increasing human activities. Although climate is a global phenomena, yet different countries and regions contribute in varying proportion to the presently observed Climate change. Guinness and Nagle (2006) asserted that the developing countries, Nigeria inclusive contribute just about 20% of greenhouse gases, yet they suffer more from the effects of climate change due to lack of fund to mitigate the effects and adopt adaptive measures. Paehler (2007) also made the

same observation when he stated that, although the industrialized countries of USA, China and others are the major contributors to greenhouse gases that trigger climate change. The developing countries who contributed insignificantly to global climate change are the most vulnerable to the effects. For instance, while one person in Africa contributes just one ton of carbon emission per year, USA has 16 tons per capital carbon emission per year.

In Nigeria, just as statistics revealed that population is increasing, so also, evidences abound that climate is changing as well. A research conducted by Odjugo (2011) on Climate change and Global warming with particular reference to Nigeria revealed that temperature in Nigeria has increased by 1.78% within two climatic period studied, (that is 1901-1938 and 1911-2008), while rainfall has decreased by 91mm within the same period. He further stated that although there is a general decrease in rainfall amount in Nigeria, the coastal areas like Warri, Brass, Port-Harcourt, Calabar and Uyo among others have experienced slightly increasing rainfall in recent years. This significant change in temperature and rainfall over time in Nigeria is a concrete proof that climate is changing in Nigeria. However it suffice to say that even the seemingly little contribution of the developing countries including Nigeria to the greenhouse gas emission is attributable to increasing human activities which is as a result of the need to meet the various demands of the growing population.

#### Human Activities in Nigeria: An Overview

Having established the fact that population is growing rapidly in Nigeria, it becomes necessary to examine how exactly the growth of human population contribute to climate change. The increase in population by an accelerating rate over time as it is observed in Nigeria has led to a commensurate increase in human activities. Moreover, human activities are known to be upsetting the natural balance by increasing the amount of carbon dioxide and other greenhouse gases that induces climate change in the atmosphere (Guinness and Nagle 2006).

In Nigeria, agriculture is the most spatially spread economic activity. Due to high population density in some part of Nigeria especially in the southern part with a population density of about 400 km<sup>2</sup>, there is serious population pressure on land with dwindling farm land, reduction in fallow period and encroachment into the original forest to reclaimed more land for farming. In the other parts where density is lower especially the Middle belt and the Niger Delta areas, deforestation is still taking place as trees are fell for various purposes especially as wood serves as a cheaper source of fuel for the rural populace.

In every parts of the country, increase in population requires a commensurate increase in dwelling units, this again leads to the clearing of forest for construction of residential building and other structures (Sajini 2011). The over all effect of these deforestation processes is climate change as trees which originally should absorb the excess Carbon dioxide are no longer available for that purpose.

In addition, urbanization is a fast growing phenomenon in Nigeria. With 3.5% urbanization rate, made possible by improvement in transportation and communication which enhanced geographical mobility, more urban structures are emerging on a daily basis. These structures are usually with impervious surfaces which prevent evaporation and percolation. This further aggravates the impact of climate change especially flooding (CIA World fact book 2012; Odjugo 2011). The increasing numbers of automobiles in the various cities in the country also increase the quantity of greenhouse gases as fumes are released from vehicles exhaust into the air. Profuse use of electric power generator due to the poor performance of the power sector is another source of carbon emission in the country

In the Niger-Delta region, where exploration and exploitation of crude oil is prevalent, greenhouse gases especially Carbon dioxide and Methane are released into the atmosphere in large quantities due to oil extraction and gas flaring exercise. Nigeria is said to be flaring more gas than any other country in the world: 2.5 million cubic feet per day. This actually corresponds to 40% of the gas which is used in whole of Africa. Because of the methane and carbon dioxide content of the flared gas, Nigeria's gas flaring contributes more to the global warming than all the other emissions of whole Sub-Saharan-Africa put together. Also according to a study commissioned by the World Bank in 2007, Nigeria accounts for roughly one-sixth of the world-wide gas flaring which in turn, spews some 400 million tons of carbon dioxide into the atmosphere (FEPA 2011; Paehler 2007).

Indiscriminate dumping of waste and poor waste management techniques also contribute to the emission of methane, a notable greenhouse gas in various part of the country( Odjugo2011 ) The above are some of the ways through which human activities in Nigeria contribute to climate change.

#### Effects of Climate Change in Nigeria

In recent time, some parts of the country have been ravaged by floods, violent winds, desertification and erosion. These are all destructive effects of climate change. The states bordering Rivers Niger and Benue routes are the worse hit. Floods have swept through these states leaving behind huge human and property causality. The recent occurrence of flood in Nigeria could best be described as national disaster as many state including Delta, Edo, Anambra, Rivers, Kogi, Zamfara, Taraba, Adamawa, Kano, among others are affected. In Adamawa, Kano

and Zamfara, 76 people have been report dead between August and September 2012, a space of one month from flood induced disaster (Omololu, Wantu and Akubo 2012). While in Taraba, about 9,000 people have been rendered homeless due to recent flooding (Akeji, 2012). Also in Adamawa, about 89 primary and secondary schools have been submerged by flood while 45 others were converted to camps by communities displaced, a development which has informed the postponement of resumption date thereby disrupting the academic calendar in that state (Omololu, Wantu and Akubo 2012). This shows that the effects of Climate change is far reaching affecting not only the environment but also the socio-economic life of the people .

In Katsina 7 people reportedly died in the floods while thousands of houses and farmlands were destroyed. The story is the same in the southern part of Nigeria. In Rivers state, at least 1,000 person have been displaced due to overflowing of a major river. In Edo state, over 30 communities in Etsako central Etsako East and Esan South-East local council of the state were drastically affected by flood resulting from the surge from River Niger in September 2012. In Anambra State, recent flood devastated over 60 communities while in Delta State about 42,271 have been rendered homeless. (Oliomogbe et al 2012). The list is longer as about twenty one states across the Federation were affected. It suffice to state that the recent surge from Rivers Niger and Benue is a new dimension to the effects of climate change in Nigeria leading to a high magnitude of destruction both of lives and properties in the country.

Paehler (2007) stated that growing population in combination with the increasing desertification and sahelization as observed in Nigeria threatens the feeding of the people. In his view, Natural resources decrease in the north of Nigeria, meanwhile the sea level at her tropical coast in the south is rising. In the long run this may lead to internal migration and conflicts due to population pressure and the shrinking resources.

#### Conclusion

The paper examined the intricate link between Demographic change and Climate change with particular reference to Nigeria. The descriptive finding are that occurrence of climate change is basically a function of human activities rather than that of natural forces. Such human activities as identified in this paper includes Agricultural activities which lead to the replacement of natural vegetation with cultivated species all in a bid to meet the food demand of the growing population and deforestation processes like felling of trees for timber and fuel. Others include Urbanization, Oil extraction activities, which led to the release greenhouse gases as well poor waste management techniques which alter the natural composition of methane in the air. The paper also confirmed the occurrence of Climate change in Nigeria by highlighting some of its devastating effects observable in various states of the Federation. The paper concluded therefore that climate change attributable increasing anthropogenic activities which invariably has been linked to Population growth in Nigeria, has and may continue to negatively impact on the socio-economic, environment, health and the general well being of Nigerians if the appropriate mitigation and adaptation Strategies are not put in place

#### Recommendation and Policy implicaton

Given the fact that climate change manifests in increasing precipitation, Rise in sea level, prolong drought among others, it is hereby recommended to that.

- The government should embark on the dredging of the major rivers especially the Rivers Niger and Benue so as to check over-flooding of the river banks .
- Government should also embark on the building of embankments at the edges of River Niger
- Environmental education: This will be necessary so as to enlighten people on how to use the resources of the environment without causing irreversible damage to nature. It is hereby suggested that environmental education be built into our school curriculum.
- The already enacted environmental law including the tree planting issue should be thoroughly enforced using task forces coupled with strict adherence to mitigation policies.
- In the Niger Delta Region of Nigeria, where the activities of the multinational companies are the major sources of greenhouse gas emission, Thorough Environmental Impact Assessment coupled with appropriate Mitigation measures should be put in place before production commences.

However, just as Botkin and Keller (1998) observed, that underlying every environmental problem including Climate change is the issue of human population growth, every effort to solve these problems must first consider measures to limit human population growth so that the environmental resource of the concerned region or country can sustain the population without inducing population pressure. Among the various measures that can be explored to regulate population in Nigeria include:

- \* Delaying the age of first child bearing, in this case, social pressure such as quest of certificate that lead to differed marriage can be very effective.
- \* Family planning: this also counts as an effective means of regulating fertility (Family Care International 1994; Population Report 2002).

\* Population policy: The existing national policy on population can also be reviewed to assign fewer number of children, say three children to a couple and not just to a woman.

\* Improving the economic status of woman through proper education of the girl child can lead to a reduced fertility as research has proven that a woman's fertility is inversely proportional to her level of education.

The essence of these recommendations on population growth regulation is that on the long term, lower fertility will lead to a reduction in per capita greenhouse gas emissions. However, it is important to note that lower fertility is associated with economic development. Therefore, efforts to limit the growth of human population in Nigeria must go hand in hand with efforts to achieve low carbon paths of development. That includes reducing the consumption of fossil fuels such as oil, gas and coal so as to curb the adverse effects of climate change.

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