

# THE VANISHING PLANET

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## **1. INTRODUCTION**

The invitation to deliver this lecture came to me in October 2009 in Bangkok, Thailand. I was there as a team member of the Nigerian Delegation to the UNFCCC organized Bangkok Climate Change Talks at the United Nations Convention Centre, Bangkok. It started as a form of conversation in a noisy Conference Centre between Prof. Obot and I. Within a few weeks of my return to Nigeria, I again met Prof. Obot in the office of the Honourable Minister of Environment, John Odey. He literally forced my hand with the demand of a “Yes” or “No” answer right in the presence of the Minister. At that moment I realized that my next breath of fresh air might depend on the next word I would utter. I said yes to him so that all present could hear. Subsequently the good Prof. sent a formal letter of invitation.

I was not at all hesitant in accepting the invitation to deliver a lecture in memory of an eminent Nigerian that Chief S. L. Edu was. I needed to be sure that the Prof was not carried away by the events and heat of the conference in Bangkok. This is so because a review of the list of the equally eminent Nigerians who have walked through this path presents a formidable group that makes me wonder if I am not threading where eagles dare. Saying yes seemed presumptuous, but saying no might lead others to question my sanity. It was therefore with a great sense of gratitude that I accepted this honour and I say thank you to the Prof and members of the Trustee.

## **2. THE GREAT ENCOUNTER**

My first encounter with Chief S. L. Edu was some 20 years ago. I was at that time very close to some of his children and his grand children became friends with my children. We were introduced then by one of his sons at the first of his birthdays that I was able to attend. Subsequently we would talk about his work and my interests in saving the environment. He made me realize how it could be difficult for me to make an impact at that time considering my full time job as the MD/CEO of Costain (West Africa) Plc. That advice was a contributory factor in my early retirement from my working career.

Chief S. L. Edu could be said to be the foremost environmentalist that this nation has produced, though he was a self made environmentalist. A census of the world’s great environmentalists would reveal that Chief S. L. Edu was not alone in this company that is striding to keep us from destroying ourselves. There is this notion that the public perceives the problem of the environment as that of the rich and wealthy. Al Gore started his crusade as a young man in his twenties; Wangari Maathai had been talking about this as a young mother in Kenya; our own Chief S. L. Edu had been in this crusade long before founding the Nigerian Conservation Foundation, which Chevron has so generously supported over the years. But it is true that nobody listened to these environmentalists until they became ‘somebody’ in their various societies. Al Gore had to make the Vice-President of the USA before we could listen to his message; Wangari Maathai had to become Minister of Environment in Kenya before she was taken seriously; Chief S. L. Edu had to build himself up the social and economic ladders before

Nigerians took him seriously. Thank God he has left us this legacy, for which we now honour him today and every year.

In our planet Earth, we have many inhabitants, some of who we see and some that we do not know about. Among the many inhabitants we have many groups that belong to different schools. There is the group who found out through life that they owe a great debt to the environment and have gone ahead to give back a lot more than they had taken. This is the group that Chief S. L. Edu belonged to. May his memory continue to guide our actions and responsibilities to the environment we live in.

### **3. THEORIES ON VANISHING PLANET**

There are various theories about the vanishing Planet Earth. One of such theories is about the dying Sun. Over the millions of years that the earth has been in existence the sun has been in an expanding motion, burning up millions of tons of Hydrogen, its most constituent element, in the process. A continuous expansion of the sun will bring the sun closer and closer to the earth surface. The intense heat generation by fusions in the sun will burn up the planet and anything else in the path of the sun. Thankfully this phenomenon, as anything else in geological time, will take billions of years to play out. We and many more generations will not be here then. It is also unfortunate that we cannot do anything to slow down or stop a geological process. So as the Americans say; "we have had it"

But whilst geological processes will slowly, painstakingly, and surely play themselves out, we the humans on this planet seem to be in a hurry to overtake geological time. We are hell bent on destroying this planet sooner than it is written. Global Warming is the other theory of the vanishing planet earth; it is real, it is the most dangerous, mostly man-made, and the fastest way to achieve the goal of destroying mankind.

### **4. GLOBAL WARMING**

Global Warming refers to the notion that the earth has been getting warmer and warmer through the emission of green house gases (GHG) by the various economic activities that mankind has unleashed upon this earth since the Industrial Revolution. It is a theory that recognizes that these GHG have the potentials of damaging the ozone layer as well as altering the balance of stratospheric and tropospheric ozone layers in the earth's atmosphere. Ozone is a greenhouse gas, along with carbon dioxide (CO<sub>2</sub>), methane (CH<sub>4</sub>), nitrous oxide (N<sub>2</sub>O), and halogen source gases. The accumulation of these gases in Earth's atmosphere changes the balance between incoming solar radiation and outgoing infrared radiation. Greenhouse gases generally change the balance by absorbing outgoing radiation, leading to a warming at Earth's surface. Stratospheric and tropospheric ozone both absorb infrared radiation emitted by Earth's surface, effectively trapping heat in the atmosphere. Stratospheric ozone also significantly absorbs solar radiation. In addition the GHG does form a blanket of gaseous cloud that prevent the sun's rays from being radiated away from the earth surface after striking objects on earth. The sum total of these effects is an entrapment of heat within the earth's surface with many attendant consequences.

It is now fashionable to speak of **Climate Change**, for some in a vain attempt to divert attention from global warming; these are the people that are in self denial, they comprise of those who are endowed with intellectual gift from God which they have wittingly misapplied over a period of 20 years or more, confusing themselves in trying to convince us that global warming is unreal and imaginary. Some of these scientists and so called experts God has taken away, others will soon join them and may they never rest in peace.

Thankfully, due to the doggedness of the many good ones, Climate Change today has become more or less an acronym for the sum total of all the changes that have affected, and the consequences of these changes to, our world climatic systems. It is now generally accepted that there is a warming of the climate system as a consequence of human activity. As assessed by the United Nations' Intergovernmental Panel for Climate Change (IPCC), in its Fourth Assessment Report, global atmospheric concentrations of greenhouse gases have increased significantly because of human activities since 1750. Current atmospheric concentrations are generally believed to have arisen principally from the result of historical emissions of greenhouse gases by the developed countries starting from the Industrial Revolution periods. Current per-capita emissions in developed countries remain relatively high compared to those in developing countries, as noted in the Kyoto Convention and by the IPCC. Therefore Global Warming and by extension, Climate Change is no longer a matter for the rich or poor. It is now a world issue, and a serious one at that. It is the most singular issue beyond annihilation of the human race with nuclear weapons that threatens life on earth and the existence of planet earth.

## **5. HISTORICAL EVIDENCE OF GLOBAL WARMING**

### **Surface Temperature**

The world's surface air temperature increased an average of 0.6° Celsius (1.1°F) during the last century according to the Intergovernmental Panel on Climate Change (IPCC). This may sound very small but I assure you it is not. This will become evident when you see the consequences of such increases in the course of this lecture. But much more dramatic is the knowledge that this figure talks about an 'average' for the world and that daily or regional temperature changes are much more alarming. There are regions and places where seasonal average or daily temperatures when compared to same periods in years past differ by as much as +3.5° Celsius in a year! This is true of some parts of Kenya which has become 3.5° Celsius hotter in the past 20 years even though the continental average is 0.5° Celsius.; and also some parts of the United states of America and Australia that have similar range of temperature changes (see figures 5 - 8).

### **Ice Melting**

The polar ice is melting in an increasing proportion for the last 100 years. We all surely know that the only thing that can really melt ice is heat. The historical balance of warmth and cold that the earth found itself before 1750 has been destroyed by GHG. Pictures that were taken by satellite and from space show that the area covered by the Arctic Ice in the North Pole has been shrinking. Same is true of the Antarctica in the South Pole.

### **Disappearing Glaciers**

The Himalayas glacier supplies the water that feeds the Ganges River. The rate of melting has far outstripped the rate of regeneration of the ice in the winter months in such a proportion to produce an increase in the rate of melting of the glacier. In other words the glacier is fast shrinking. Here in Africa this same phenomenon can be found being played out with the ice caps of Mt. Kilimanjaro. Measurements have shown that over the 20<sup>th</sup> Century the ice cap has shrunk by 80% and if current climatological conditions persist, the glacier will disappear completely between 2015 and 2020 (see figures 2 and 3).

### **Bush Fires**

Bush fires occur from variety of actions which include arson, farming practices, lightening strikes, accidents, or plain spontaneity of flash points in combustible environments. Whatever the reason the conditions of favourable weather factors and combustible materials must be present for bush fires to occur. In the last 30 years the incidences of bush fires in the United States, Australia and even Europe have become frequent, the fires in themselves have been too intense, extensive in destruction and long lasting in duration. These have been attributed to longer and hotter summer months than usual (attach data, graph).

### **Desertification**

This is a phenomenon that turns fertile lands into barren, arid and desolate landscape devoid of appreciable vegetative cover. Desertification can be caused by any or a combination of these events:

- Desert encroachment whereby existing deserts engulf adjacent land areas through sand storm movements. In Nigeria the Sahara Desert has encroached into 11 northern states with the loss of 23% of land area in the last 20 years.
- Prolonged drought and reduced rainfall due to changing wind patterns caused by temperature changes within the earth surface. This is prevalent in Sudan, Niger Republic, Ethiopia, parts of Egypt and Algeria.
- Disastrous farming practices such as bush burning, poor tilling of soils that are not environment friendly in savannah areas and commonly found in Nigeria, Sudan, Chad, and the Cameroun.
- Increase in surface temperatures within the earth atmosphere. This suffocates life forms and evaporates what little moisture is left within the soil.

### **Excessive Rainfall**

In a bizarre dance of equilibrium, nature always finds a way of compensating certain areas for losses suffered elsewhere. Changing wind patterns driven by global warming carry moisture laden winds and clouds generated by excessive heat elsewhere to deposit in the tropics. Others travel through the oceans whipping up more moisture and spurning hurricanes, cyclones and typhoons of immense strength covering large expanses territorially to produce rainfalls of great intensity and long duration. Most interesting and perhaps baffling is that such weather

phenomena are now common in regions that 20 years ago would normally be contented with fair to moderate rainfalls during the spring and summer months. These severe weathers occur in Africa, Asia, Europe and the Americas.

## **6. SOURCES OF GLOBAL WARMING**

### **Greenhouse Gases (GHG)**

Most people hear about greenhouse gases but do not know what these are and how they are made. A greenhouse gas is a gas that has the properties to trap radiation from escaping through its cover. The most commonly known of GHG is carbon dioxide. Carbon dioxide concentrations are increasing in the atmosphere primarily as the result of burning coal, oil, and natural gas for energy and transportation; and from cement manufacturing. The atmospheric abundance of carbon dioxide is currently about 35% above what it was 250 years ago, in pre-industrial times. In other international assessments, much of the observed surface warming over the last 50 years has been linked to increases in carbon dioxide and other greenhouse gas concentrations caused by human activities.

Other GHG include: ozone, methane, nitrous oxide, and halogen source gases such as hydrofluorocarbons. An important link between ozone depletion and climate change is the radiative forcing from halogen source gases and hydrofluorocarbons (HFCs). Halogen source gases are the cause of ozone depletion and HFCs are substitute gases. Both groups of gases cause radiative forcing in the atmosphere, but with a wide range of effectiveness. When the principal gases in each group are inter-compared using their "*ozone depletion potentials*" (ODPs) and "*global warming potentials*" (GWPs), which indicate the effectiveness of each gas in causing ozone depletion and climate change, respectively it can be seen that the hydrofluorocarbons (HFC) which are the substitute gases for the CFCs do not harm the ozone layer.

It is important to note that, despite a GWP that is small in comparison to many other greenhouse gases, CO<sub>2</sub> is the most important greenhouse gas related to human activities because its atmospheric abundance is so much greater than the abundance of other gases.

### **Industrialisation**

Industrial effluents both in form of gases, liquids, and solids are pollutants. Indiscriminate disposal of these wastes have resulted in the pollution of the air, waters and land forms on earth. One must agree that at the start of the Industrial Revolution, the west knew nothing or perhaps little of the potent powers of these wastes in unleashing so much destruction to our climate system in so little a time. What is most baffling is the reluctance of all, in the light of new knowledge and technology, to adapt adequate measures that will stop, eliminate and correct these practices.

### **Coal & Gas Burning**

In many parts of the world coal and natural gas are burned to generate electric power for our industries and homes. Coal is also used to power trains. Here in Nigeria we need both for our

electric power generation. Besides oil companies operating in the Niger Delta of Nigeria continue flaring gases from well heads. Our refineries here and all over the world still flare gases as a by-product of the refining process that crude oil undergoes. Because these compounds are basically hydrocarbons, a vast amount of the product of this combustion is carbon dioxide, a greenhouse gas. A recent statement credited to the Nigerian Minister of State for Petroleum in December 2009 quoted him as saying that stopping gas flaring in Nigeria will lead to massive financial losses to the country. Curiously his informed opinion rests on the assertion that stopping flaring will mean shutting down these productive wells. This is a rather naïve and ignorant way to look at the problem, fed to him perhaps by the oil companies who do not want to adopt the expensive technology (like gas injection, re-development of the well) that the policy calls for.

### **Vehicular Emissions**

Perhaps this is one that everyone on earth can claim to be familiar with. The liquid fuel that powers our cars and trucks, trains, ships and airplanes is derived from hydrocarbon. Carbon dioxide is a major by product of its combustion with air. The poorer the state of the engine the less efficient it is in burning fuel. If the fuel is not efficiently burnt, more carbon dioxide will be produced. Due to its large economy, the USA is considered to be the greatest offender in this category with over 200 million vehicles on the road. Vehicle exhaust is the source of 30% of USA carbon dioxide emissions. China has a population of 1.3 billion people. If 30% of them own cars, that will be about 400 million cars on the road. Total emissions from these will dwarf that of the US. The same extrapolation can be given for India, Malaysia, Indonesia, and Brazil. Nigeria is not far behind them. These are emerging economies with huge populations and it must be accepted that affluence within the middle class will inevitably lead to a life of convenience and car ownerships.

## **7. IMPACT AND CONSEQUENCES**

The impact of climate change on the people of the world can be measured in many ways; physical damage, territorial losses, poverty indices, infrastructural damage, health indices, loss of or dwindling resources, etc. Each of these parameters can also be denominated into monetary costs. Since adaptive and palliative measures to ameliorate the consequences of climate change are also cost driven, it is customary to address the cost impact of climate change.

The Intergovernmental Panel on Climate Change (IPCC, 2007) concludes that “impacts of climate change will vary regionally but, aggregated and discounted to the present, they are very likely to impose net annual costs which will increase over time as global temperatures increase.” The IPCC estimates that for increases in global mean temperature of less than 1-3°C (1.8-5.4°F) above 1990 levels, some places and sectors will see beneficial impacts while others will experience harmful ones. However for increases in temperature greater than 2-3°C (3.6-5.4°F) the IPCC says it is very likely that all regions will experience either decline in net benefits or increases in net costs. The IPCC concluded that “taken as a whole the range of published evidence indicates that the net damage costs of climate change are likely to be significant and to increase over time.”

### **Impact of climate change on ozone**

Certain changes in Earth's climate could affect the future of the ozone layer. Stratospheric ozone is influenced by changes in temperatures and winds in the stratosphere. For example, lower temperatures and stronger polar winds could both affect the extent and severity of winter polar ozone depletion. While the Earth's surface is expected to warm in response to the net positive radiative forcing from greenhouse gas increases, the stratosphere is expected to cool. A cooler stratosphere would extend the time period over which polar stratospheric clouds (PSCs) are present in Polar Regions and, as a result, might increase winter ozone depletion. In the upper stratosphere at altitudes above PSC formation regions, a cooler stratosphere is expected to increase ozone amounts and, hence, hasten recovery, because lower temperatures favor ozone production over loss. Similarly, changes in atmospheric composition that lead to a warmer climate may also alter ozone amounts. Thus in hotter regions ozone layers may be reduced and if there are present CFCs and halons, the ozone level is actually depleted, leading to more global warming. The consequences are hotter and longer summer months, drier winters, less rainfall in arid areas, changing wind patterns, etc.

### **Health Effects**

Another consequence of this is increase in the frequency of heat waves. It is likely that heat waves may become more common in more areas of the world. It is known that warmer temperatures affect human health. A review of the world demographics will show that there have been increases in heat-related deaths, some distribution changes in animals that carry diseases like mosquitoes, as well as increase in the length of the pollen seasons that are related to the flu seasons in Europe and the Americas. Here in Nigeria the hot seasons are related to high incidences of meningitis in northern Nigeria. It is even known to have spread to the southern parts of the country due to congestion and overcrowding in some colleges and in the slums of the cities.

### **Rising Sea level**

The IPCC said also that during the 20<sup>th</sup> Century, sea level rose about 15cm due to melting glacier ice and the expansion of warmer sea water. Some models are predicting if current lifestyles are maintained, sea level may rise by as much as 59cm during the 21<sup>st</sup> century. If this happens many coastal communities, Small Island States (SIS), wetlands, deltas and coral reefs will be submerged. Most alarming is that the Arctic sea ice is also melting. The current summer thickness of sea ice is about half of what it was in 1950. A section of the Antarctic ice sheet that has sheared off is melting and if allowed to completely melt down would raise worldwide sea level by 1.4m

The African coastal zone consists of a narrow, low-lying coastal belt, which includes the continental shelf of 32 mainland countries. Within these coastlines lie a variety of ecosystems including lagoons, deltas, small islands, mangroves, the Niger and the Nile deltas, as well as pristine islands of Cape Verde, Sao Tome and Principe. A large percentage of West African urban population lives in coastal cities. In Nigeria about 25% of the national population lives along the coastal zone; 4.5 million Senegalese live in Dakar coastal area. In Ghana, Benin, Togo,

Sierra Leone, and Nigeria most of the economic activities that form the backbone of the national economies are located within the coastal zone. The coastal zone of east Africa extends from Sudan to South Africa incorporating all the near-shore islands east of Tanzania and Mozambique as well as the oceanic island of Mauritius, Madagascar, the Comoros, and Reunion.

North America is boarded on the east by the Atlantic Ocean, on the west by the Pacific Ocean, and on the south by the Gulf of Mexico. The entire coastlines of North America are susceptible to inundation from rising sea level.

If sea level rises inundation could occur along more than 70% of the Nigerian coastline and that of Senegal as well. Using Nigeria as an example, Awosika et al., 1992 had shown that with a 1 metre rise in sea level, up to 600 km<sup>2</sup> of land would be lost along the Nigerian coastline. Without consideration of the oil wells in the Niger Delta, monetary values put the cost of losses to about \$1.3 billion for a 0.2 m rise to \$14 billion with a 2 m rise in sea level. If the value of the oil fields is factored in, the value at risk ranges from about \$2.2 billion for a 0.2 m rise to anything between \$6 billion and more than \$19 billion with a 2 m rise in sea level. These figures, published in 1992 will pale to significance if evaluated today given the massive investments that have occurred in the last 15 years in our oil industry.

In addition a potentially massive environmental refugee migration will occur. The authors estimated that the number of people that would be displaced range from 740,000 for a 0.2 m rise to about 3.7 million people for a 1 m rise and 10 million people for a 2 m rise. We all know how most of our fishing villages are located. What these scenarios portend is that with a sea surge of about 2 metres, about 85% of the Ijaw nation may be swept away; Victoria Island, Ikoyi foreshore, parts of Lekki Peninsula will be submerged. This is not an unlikely doomsday model for we need to remember that the tsunami that hit Indonesia in December 2006 had walls of water 4 or more stories high (i. e. 12 m high). I have always wondered where Lagosians will evacuate to if a hurricane the size of Katrina or Ike comes ashore in Lagos area. A lot of people do not think we can ever face threats from hurricanes; I say they are engaging in delusions and wishful thinking. We have discussed here about changing wind patterns and regions coming under severe weather situations that were alien 20, 50 years ago. People who do not want to wake up to the world of possibilities and realities in the environment are in total denial; they are aware of the pertinent issues of the environment but refuse to acknowledge them. I plead God's fire and forgiveness on them.

### **Hurricanes, Monsoons, Typhoons and Seasonal floods**

Hurricanes spawned in the Atlantic, Cyclones of the Indian Ocean, Monsoons in Asia, and Typhoons spawned in the Pacific have been occurring with increasing fury and regularity the last 50 years. There is enough evidence to show that the number of intense hurricanes have increased in the Atlantic since 1970. These sometimes provoke rises in sea levels as is the case of Katrina, Ike and, Andrew hurricanes. These weather phenomena always cause intense and prolonged rainfalls, flooding, of lowlands and river basins, mudslides, erosion, destruction and deaths of one form or the other. The current pattern of these severe weather occurrences have

been related to climate change. The economic devastation caused by them are astronomical, the consequences on the human psyche are catastrophic.

Hurricane Katrina that made landfall in continental USA in the early hours of August 29, 2005 was the sixth strongest hurricane since recording began to hit mainland USA. The massive hurricane had a diameter of 545 km and was a category 3 hurricane when it made land fall east of New Orleans. Its effects including severe rainstorms were felt in 10 states of USA and as far north as Ontario and Quebec in Canada. With over 1 million people evacuated, Katrina still caused the death of 1,836 people with 705 others unaccounted for. Storm surges of 4-5m high caused 53 breaches in canal and embankment levees. The entire city of New Orleans was under water for days, 4.5m deep in places. Total estimated damage was over \$100 billion.

Recent flooding in USA in September 2009, and in Britain in November 2009, have all been attributed to the effects of Global Warming. Even though it occurred in the middle of the hurricane season, the September heavy rainfalls that battered 4 southern states of US had nothing to do with hurricanes. It was the result of a tropical depression that was fueled by excessive summer heat. In Georgia alone heavy rains fell continuously for 7 days, dumping as much as 560mm of water in one week, with half of that in a 24 hour period in places. The resulting floods washed out river banks, roads and bridges, power lines, homes and businesses. Schools were closed for up to 1 week and preliminary estimated damage was put at about \$850million. In Britain on the other hand its recent flooding arising from heavy rains occurred in November, an autumn month. This is unusual and is attributed to unusually hot summer and winter of 2009. Heavy rains, flooding and gale force winds of 130 kmph battered the United Kingdom from November 13 through November 21 2009. This severe weather dumped over 314mm of rain in places over a 24 hour period, the highest in recorded history so far. Over 1300 houses were affected with many more left without power supply for days.

The yearly damage done to the Bangladesh economy by seasonal flooding that comes with the monsoon season is mind boggling. The human suffering in this low lying country is so much that I think the UN ought to declare the entire country a disaster zone. Estimates of economic losses arising from these annual floods are difficult to come by due to the simple fact that repeated cycle of damage has impoverished the people so much that there is practically no basis to start from anymore.

Mozambique in our own continent had its own share of severe weather systems that practically submerged the country for 3 weeks early in the year 2000.

Landslides in South America threaten many communities in many countries.

### **Disappearing Polar Ice and Glaciers**

The Arctic sea ice and the Antarctic ice sheet are melting faster than they are reforming. Greenland's ice sheet is melting faster too.

Elsewhere glaciers and permafrost are melting. Observations have shown that over the past 100 years mountain glaciers in all areas of the world have decreased in size and so have the amount of permafrost in the Arctic. We have seen the case of Mt. Kilimanjaro in Kenya and Tanzania. The case of the Himalayan glaciers is most alarming. The River Ganges, the longest river in the world, is fed by the Gangotri glacier at a height of 14,000m up in the Himalayas Mountain. This river cuts across an entire continent of India, flowing from the northern plains of India to the Bay of Bengal. This river is a source of fresh water to millions of people, provides water for irrigation and farming to thousands of communities, and supports a whole range of ecosystems, cultural and spiritual beliefs across the continent. If this river disappears one day, the consequences of that would be gigantic.

### **Desertification**

Desertification is global warming, and we have seen that global warming leads to desertification. One consequence of global warming is desertification; and desertification breeds its own consequences. The BBC news online of October 28, 2006 quoting a report by a coalition of UK aid agencies and environmental group, reported that "Climate Change is already affecting people across Africa and will wipe out efforts to tackle poverty there unless urgent action is taken." Continuing it also says that droughts are worsening; arid and semi-arid areas in northern, western, eastern and parts of southern Africa are becoming drier. It is also estimated that in 2005 25 million people in Sub-Saharan Africa faced food crises. We all remember the cases of Niger and Sudan in 2005 – 2008.

Higher temperatures cause a higher rate of evaporation and more droughts in some areas of the world. At current levels of temperature increases, areas that are currently prone to drought are expected to become even drier over the next century. With drought and loss of harvest come deaths of man and animals. The living that can muster enough strength migrate southwards in search of water, life, and farmlands. The influx of strangers ready to appropriate lands in many communities tends to create intertribal wars, militancy, and crime. We have seen these in Sudan, Niger, and Chad.

Lake Chad that once was both a tourist attraction, and a water source that supported lives and agricultural businesses in the past has shrunk to less than 47% of its size in a little over 40 years. This is a direct result of desert encroachment. Right in front of our eyes a water source that supports life in 3 countries is dying. And as is typical of us we are doing nothing to reverse it! I once encountered a former Nigerian President in Katsina and in our course of discussions we shared thoughts on the environment. The President to my consternation remarked that the environment is all about clearing drains and gutters. Even at that, if the gutters and drains were cleared during his tenure we will not have this same level of degradation we have today. There is yet another important group of people in authority who understand clearly the issues on the environment but continue to politicize them for their political and ignoble ambitions to the detriment of the very communities they represent, failing even to provide a line in our 7 point agenda of this dispensation. I want to remind them of the Native American proverb that says: ***"We do not inherit the Earth from our forefathers; we borrow it from our children."*** This group of people I will leave to the judgment of their children's children.

## **8. WHAT TO DO TO REVERSE THE QUICK MARCH TO OBLIVION**

The World View of Global Warming project by the Blue Earth Alliance of Seattle Washington warns that rapid climate change and its effects is fast becoming one of the prime events of the 21<sup>st</sup> Century. It is real and it is accelerating across the globe. As the effects of this change combine with overpopulation and weather crises, climate disruptions will affect a lot more people than war. The urgency of climate action by the world is even greater now because some recent observations are at or beyond the highest projections of previous reports. For instance rates change of global mean temperature, sea level rise, ice sheet changes in Greenland and the edges of Antarctica are running at the highest projections of IPCC 2007. More CO<sub>2</sub> is being put into, and left unabsorbed in the air than before. We must act now, all of us.

Scientific studies, common sense, and survivability have all shown us that we need to take measures to protect ourselves and countries from the effects of climate change, control our economic and social activities within environmentally friendly parameters, devise and adopt measures that will reverse the current trend in global warming. All these will require adaptative and mitigating actions from both developed and the developing world.

In consequences therefore, Adaptation Strategies and Measures in

1. Coastal Areas will be in the form of construction seawall defenses, erosion controls, urban growth planning, building setbacks, wetland preservation, and integrated coastal zone management.
2. Managing Earth Surface Temperature increase lie in completely stopping the damaging of the ozone layer; control and reduction of GHG emissions; efficient and greener management of industrial effluents; use of greener fuels to power our vehicles, ships and airplanes; reduction in deforestation activities.
3. Managing the Disappearing Polar Ice and Mountain Glaciers also is deeply anchored in the control of the earth's surface temperatures. In order to reduce the rate of ice melt in the summer and at the same time increase the rate of re-freezing in the winter months, we have to slow down the rate at which the earth is burning up. Strictly speaking we must get rid of all GHG through the use of better and greener technology.
4. Managing Severe Weather Conditions again have their roots in the control of the earth's surface temperatures. A good review of the earth's temperatures by country will show alarming departures from 1950 levels in many countries. As a student in London in the early 1960s I could not remember any summer that lasted beyond a few weeks to 2 months. Now summer temperatures are seen in the British Isle from spring to well into autumn months. The same is true of central Europe, the Mid-west and South of United States, and Australia. These hotter than usual temperatures spurn severe weather conditions like tornadoes, hurricanes, typhoons, intense and severe rainfalls, frequent

floods, bursting of river banks, mudslides and landslides. Therefore any measures that would limit the emissions of GHG will reduce the rate of global warming.

5. Managing Desertification involve those measures that will tame the desert. These include planting of trees, looking for and providing water to the desert, afforestation, and implementation of good farming practices. Again we must also control the rate of or stop global warming.

A closer look at the adaptive measures enumerated above will clearly show that unless something drastic and universal is done, global warming will ensure many dry areas are going to get drier and wet areas are going to get wetter. In the words BBC news, they are going to be caught between the devil of drought and the deep blue seas of floods.

The adaptive measures required all have costs implications. Countries must spend monies to protect themselves from the effects of climate change and also spend monies to develop or procure new technologies that will help prevent any further slide into the path of world destruction as we know it. A few examples will suffice here.

#### **Coastline Protection**

- In Egypt the total costs of coastline protection is estimated to be \$21 million for 0.5-m rise and \$42 million for 1-m rise in sea level according to El-Raey et al. (1995)
- In Nigeria if all shores are protected we need \$1.4-1.8 billion dollars for 1-m rise in sea level according to French et al. (1995)
- In Senegal total protection will entail the construction of 2,063 km of seawall according to Dennis et al. (1995)
- In the United States of America the cost of seawall protection and maintenance of vulnerable portions is quite fluid. This is because these actions are continuously being done year in year out. As we can imagine this will dwarf whatever will be spent in other countries due to the sheer size of the country
- Vulnerability studies conducted for selected small islands suggest that the costs of coastal protection ("hard" options) would be a significant proportion of their GNPs. In Malta and Cyprus, it is estimated that approximately US\$550 million and US\$190 million, respectively, would be needed to provide adequate shore protection works against a 20-30 cm rise in relative sea level (Sestini, 1992). Although these estimated costs might not be excessive in the context of large economies, they represent considerable financial resources that these small island states would have to reallocate.

#### **Adaptive Measures for Desertification**

- It is advantageous to promote natural responses from trees that show ability to thrive in the Desert
- Arid countries should encourage and promote deliberate planting of trees

- Such countries under threat of desert encroachment need to carry out endangered species habitat management, water shed manipulation, and use of anti-desertification techniques in farming and wood harvesting.
- The cost of taming the desert is huge, running into billions of dollars. Thankfully though it can be shared amongst various disciplines; land conservation, water supply, farming, afforestation, erosion control.

### **Other Adaptive Measures**

The other adaptive measures to limit global warming involve the development of green technologies that will drive our power industries, economy, manufacturing and social life styles. These measures are targeted at controlling the emissions of GHG into the earth's atmosphere. The world must continue in its search for these green technologies if we are to slow down our precipitous march to certain destruction. Current technologies that can be used reside with the developed countries. These should be made available to developing nations at affordable costs.

The great tragedy is that Africa, Small Island States, and the developing world have played no role in global warming, a problem that was in the main caused by the economic activities of the rich, industrial countries. It is this fact that has driven the Kyoto Protocol and now to come the Copenhagen Protocol. A sore aspect of these protocols has been the costs of mitigation and adaptation. Due to the historical imbalance of sources of global warming, industrialized Governments have been mandated to provide the funds needed by the developing countries to tackle adaptation and mitigation. Between \$10bn and \$40bn is needed annually. The UNFCCC set up a bank account for the deposits of funds from the industrialized countries. Of \$1.6bn pledged, only \$260mn was paid into this account by 2009. Yet the developed countries claim that they have met their obligations through perhaps other aid efforts.

Another factor is the issue of green technology, copyrights and costs in relation to their dissemination. The protocols are driving the agreements towards a more liberal approach to copyright laws, advocating open sharing of relevant applicable technologies, low prices when costs have to be paid, and training of personnel in applicable disciplines.

The cost of insurance is yet one more important factor that must be taken into consideration in any assessment of climate change impacts on infrastructure. Property insurance costs are extremely sensitive to the effects of catastrophic events such as hurricanes, floods, and earthquakes. High-risk locations therefore could face high insurance premiums-and even, in extreme cases, withdrawal of coverage. This is common in Small Island States.

## **9. WHITHER NIGERIA**

One could ask; where does Nigeria feature in this global fight for a greener planet? Interestingly, and to the consternation of some skeptics, the answer is that we are very visible, though confused. On a slower pace, Nigeria has been fighting environmental degradation in its

own ways. Some measures are succeeding, others are failing; regrettably it looks like a huge pile of ad-hoc actions with poor definition and focus. Consider the following:

1. The major shoreline protection carried out recently is that of the Bar-beach. This is targeted at saving Victoria Island when there is a surge. Since its completion, 2 ocean surges following some moderate strength storms have overflowed the barrier.
2. There has been considerable progress in the programme to eliminate gas flaring in the Niger Delta; this has not been completely stopped
3. Oil spills by oil companies is common. Even before the advent of Niger Delta militancy the oil companies would attribute any oil spillage to sabotage so that they can avoid the payment of industrial fines and compensation for damages. Of course our ignorant and compromised officials knew no better.
4. With the drive to produce electrical power for our economy we are resorting to gas powered plants. These will still produce GHG. Worse still a lot of independent power generating licenses is being dished out to companies by very many states. What we do not see yet is any regulating body on the technology to be used or the emission standards to adopt.
5. Apparently there are no emission laws limiting emissions of carbon dioxide (CO<sub>2</sub>) and carbon monoxide (CO) from vehicles on our roads. I can tell you that in 50 years nobody has ever asked me for the emission certificates of my cars in Nigeria.
6. The fight against desert encroachment in the shelter belt regions is most pathetic. Tree planting is not going well; those planted are allowed to die or are cut down for energy. The Shelterbelt Commission today exists only in name.

It is apparent that we have basic sound initiatives on what we need to do to fight environmental degradation; what we need to develop are good blue prints on the way to go, the political will to implement the blue print, and an economic plan that must respect the blue prints. Currently Nigeria has no policy on combating climate change. This is unacceptable for a country of our resources. With the coming of the Copenhagen Conference in December 2009, Nigeria must take a firm stand on the various issues that are outstanding in the negotiations. To the credit of the Honourable Minister of Environment, John Odey, I was a party member at the UNFCCC Bangkok Conference that ended October 9, 2009. My report to the Ministry of Environment at the end of the conference included the following recommendations which we took along with us to Copenhagen;

- Developed countries have a historic responsibility for their disproportionate contribution to the causes and consequences of climate change.
- Developing countries face adverse effects of climate change and threats to their future economic potentials.
- The Copenhagen negotiations must not be stalled in semantics or the inflexibility of certain nations.
- Developing country Parties must also recognize they have a contributory role in climate change. It is not feasible that the entire costs of mitigation, adaptation, and technological transfer required to combat climate change and its effects in the developing countries as well as their own should be borne the developed countries.

- In the spirit of international diplomacy, developing countries whilst seeking to protect their best interests must as of sovereignty and dignity exercise restraints in demands and show some willingness to own up to some responsibilities.
- While developing countries can insist that the developed country Parties contribute to a large extent the funds required for **Adaptation** and **REDD+** we should be ready to pursue **NAMA** on a mixed-funding basis.
- Developing countries should demand free capacity building and discounted costs of technology transfer. We should also insist on mandatory sharing of technology, collaboration in research and development, and sharing of results.
- The funds contributed by the developed countries must be equitably applied for the mitigation and adaptation strategies to be undertaken by developing countries. In applying this fund, developing countries should be trusted to use the funds judiciously, and not to be left to the control of the contributing countries.

## 10. FADE AFRICA

I founded FADE Africa, an acronym for "Fight Against Desert Encroachment in Africa, in the year 2000 shortly after my second solo drive across the Sahara. We are 10 years old this year. Ten years ago I did not know I would get this far. Today in our little ways, we have preached the message on the need to tame the desert to all corners of the Globe. I have been to the Negev desert in Israel, the Arizona and Nevada Deserts in United States of America, the Cold and Arid Regions Environment and Engineering Research Institute in the Gobi Desert, China (CAREERI) and the Kalahari Desert in Namibia. FADE Africa has signed MOUs for co-operation and education with Ben Gurion University in Israel and CAREERI in China.

Here in Nigeria, FADE has established a wall of trees programme in Makoda whereby a dying town was slowly recovered from the brink of desertification. We established tree planting competitions in 15 secondary schools since 2006. We are partnering with Lagos State Government in the greening of Lagos as well as the soon to start Reality Show programme on desertification. This show holding in Agadez with 50 contestants will culminate in a Trans-Saharan drive from Lagos to London this March.

These things we have done and I believe we can still do more. It is individuals like all those here and gone like the one we honour today that will make a difference. Our actions will galvanize governments here and elsewhere to act. I please urge you to join us.

## 11. CONCLUSION

In December of 2009, most major news networks carried the story called "The Big Climate Change Fraud." This was just before the Copenhagen Conference of 7<sup>th</sup> – 22<sup>nd</sup> December 2009. This propaganda of a report alleges that though there is climate change, mankind has nothing to do with it. To support their theory, they produced some form of evidence they claim to suggest that a leading research unit in a university in England had massaged some scientific data to prove that global warming is taking place. Furthermore they went on to say that Copenhagen Conference is "a hot air underpinned by fraud."

My question had always been; "Who are these scientists and how prepared are they to debate these so called scientific data in the public domain?" we must admit that history is strewn with not a few fraudsters who have manipulated observed data for personal recognition. But these incidences are few compared to overwhelming evidences of valid data that support the facts of global warming. It is equally true that climate can change by natural causes; but these take millions of years to manifest. What we are witnessing today is a manifestation of rapid changes within our lifetime. Even non-scientists can see, feel, observe and live through these changes. These are undeniable occurrences. I challenge these scientists 'rogue' scientists that abhor human interference in the events of climate change to provide an explanation to the following:

- The drought that ravaged Ethiopia and Eretria as well as some parts of Niger and Northern Nigeria where people had no rainfall for 2 years in the 1980s.
- The encroachment of the Sahara into towns and villages in Africa
- Floods in Mozambique, United Kingdom, USA
- Receding rivers and lakes as in Lake Chad

One wonders the motives of such "activists". There is good economic sense to argue against climate change, and there are equally good economic incentives to argue for climate change. We will all feel good if only global warming could be attributed to the dying sun that is getting hotter and hotter. That process is billions of years away from completely frying the Earth. But the overwhelming evidences on ground point all accusing fingers to our actions on earth as being the accelerating force towards our imminent destruction of this beautiful planet. If we hasten this destruction by not heading the warning signs and acting fast and decisively towards mitigating environmental disasters, we would be aiding geological processes rather than mastering the earth as we were biblically meant to do.

Thank you.

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