

Africa's Initiatives In and Responses to Climate Debates and Processes: Nigerian Experience

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Abstract: *Climate change, a growing number of voices in media and policy circles, warn is raising the risk of severe weather condition, ushering-in: poor agricultural yield, near-extinction of cherished flora and fauna and violent conflict in the twenty-first century across the globe. In Nigeria, the cereal-productive Sudan savannah ecology is transiting to poor Sahel and the influence of the Sahara is increasing southwards, therefore, the searchlight is beamed towards agriculture in Nigeria. What is needed is an honest and open debate about how to build a resilient society. Adaptation remains a suitable and necessary public policy choice. Published data from different sources as acknowledged in the text were used. In a situation of unbearable climatic change and its attendant negative effects, adaptable initiatives and responses were recommended.*

Keywords: Africa, Initiatives Climate, Debates, Processes, Nigerian

1.1 INTRODUCTION

International protocol on climate change (IPCC, 2007) defines climate change as a change in the state of the climate that can be identified (for example by using statistical tests) by changes in the mean and/or the variability of its properties and persists for an extended periods, say decades or longer. Although the length of time it takes the changes to manifest matters, the level of deviations from the normal and its impacts on the ecology is most paramount.

However, climate change is different from the generally known terms like climate fluctuations or climate variability. These terms denote inherent dynamic nature of climate on various temporal scales. Such temporal scales variations could be monthly, seasonal, annual, decadal, periodic, or non-periodic.

Climate change is caused by two basic factors which include natural process (bio-geographical) and human activities (anthropogenic). The natural processes are the astronomical and extraterrestrial factors, the astronomical factors include the changes in the eccentricity of the earth's orbit, changes in obliquity of the plane of ecliptic and changes in the orbital precession while the extraterrestrial factors are the solar radiation quantity and quality among others. On the other hand, the anthropogenic factors in climate change involves human activities that either emit large amount of greenhouse gases into the atmosphere that depletes the ozone layer or activities that reduce the amount of carbons absorbed from the atmosphere.

In fact, the human factors that emit large amount of greenhouse gases include industrialisation, burning of fossil fuel, gas flaring, urbanisation and agriculture. Similarly, human activities that reduce the amount of carbon sinks are deforestation, alteration in land use, water pollution and negative agricultural practices. The human factors have been proven to be responsible for the ongoing unequivocal climate change or global warming (IPCC, 2007).

The emitted greenhouse gases are carbon dioxide (CO₂), Chlorofluorocarbons (CFCs), Methane (CH₄), and nitrous oxide (N₂O) among others. Although carbon dioxide (CO₂) has the highest contribution to greenhouse gases, its potency is far lower. For example, a gram of CH₄ is about 23 times higher than the effect of the same volume of CO₂ and a gram of sulphur hexafluoride (SF₆) released into the atmosphere is about 22,000 times that of CO₂ with respect to tropospheric ozone depletion (IPCC, 2007).

Already, Abam (1999) points out that the delta has experienced shift in the ecological equilibrium manifested as adjustments to the coastline geometry, lower flood water levels and upstream migration and tidal influences; this associated with upstream damming, is expected to be exacerbated by the planned dredging of the River Niger and global sea level rise, while oil exploration provides additional risk of relative sea level rise. The above justify the vulnerability of the region to global and regional climate change particularly those associated with sea level change.

However, apart from the twin- problem of erosion and desertification which are already a menace in most African countries and Nigeria in particular, climate change would accelerate the associated inundation, increase problems of flood/intrusion of sea-water into fresh water sources and ecosystem destroying such stabilizing system as mangrove, and affecting agriculture, fisheries and general livelihoods (Akinsi et al., 2008).

Scientists around the world now agree that the climate changes occurring internationally are as a result of human activities.

Although responsibility for the causes of climate change rests primarily with the developed and industrialized nations, the cost of climate change will be borne most directly by the poor countries; this is for a number of reasons, including;

- Many of the regions likely to be adversely affected fall in the developing world.
- The poor are proportionately dependent on occupations such as farming, that are adversely affected by the change, and
- Because poor nations have very limited resources, they do not have the ability to adapt to climate change in the way that wealthier households can. In particular, changes to water quality, quantity, and availability will be an impact of ongoing climate change in many areas (Holmes, 2007).

Climate change is caused by greenhouse gases (GHGs), which enhance the 'greenhouse' properties of the earth's atmosphere but prevent the reflected heat from escaping back into space. According to Holmes (2007), this causes the earth's temperature to rise. Greenhouse gas emission has been since industrialization in the 1900s due to increased burning of fossil fuels. Further significant increase in GHG levels are expected, particularly as developing countries become more industrialized.

Fossil fuels are expected to dominate this increase, and subsequent GHG emissions will in turn lead to rising temperature.

Nevertheless, more recent research finds that these temperatures are actually much higher than previously thought. GHG emissions are not remaining stable; they are increasing due to increased energy consumption as a result of population growth and industrialization.

Available literature reveal that concerns over the pace of climate change are compounded by two mechanisms - known as non-linear biophysical changes and positive feedback mechanism which could further accelerate the damage caused by climate change (Holmes, 2007). Non-linear biophysical changes refer to sudden or extreme climate changes caused by the physical and biological factors that influenced the earth's climate. Similarly, climate change can be further accelerated by positive feedback mechanisms.

This paper does not offer recommendations for specific initiatives. Each area has its own needs and vulnerabilities, and there are many variables to be analyzed. For example, a given response could be timed to address observed or expected climatic shifts, resource shortages, the observed impact of shortages, or any violence or other poor reaction that follows.

The top challenge today is setting up new notion of human ecology. Even as conflict-sensitive adaptation to climate change requires policymakers to zoom in to fine levels of analytical detail, Nigeria needs to zoom out to the bigger picture. President Goodluck Jonathan's government could use climate change as one avenue for starting to negotiate twenty-first century Nigeria, a chance to reflect on what social and economic future the country sees for itself.

2.1 LITERATURE REVIEW

Holmes (2010) points out six critical areas that are severely being impacted (negatively) by climate change the world over.

However, he also maintains that there will clearly be some gains from climate change (for example, agriculture in some northern region should increase in productivity due to a rise in temperatures). Accordingly, the six major areas include: -

- **Water:** Obviously, rising global temperature will lead to intensification of the hydrological cycle, resulting in dryer dry seasons and wetter rainy seasons, and subsequently heightened risks of more extreme and frequent floods and draught. Furthermore, he opines that changing climate will also have significant impacts on the availability of water, as well as the quality and quantity of water that is available and accessible.
- **Agriculture:** Concerning agriculture world-wide, Holmes (2010) asserts that declining crop yields are likely to leave hundreds of millions without the ability to produce or purchase sufficient food supplies, especially in the third world countries. At mid high latitudes, crops yield may increase for low level change in temperature, but will decline at higher levels of temperature change.
- **Ecosystem:** Furthermore, changing temperatures will cause ecosystems to shift forest, and types of plant species will die back in some areas as temperature rises, but increase in other areas. However, Holmes (2010) cautions that the pace of change in temperature may be too fast for ecosystems to adjust, resulting in the loss of forest and species.
- **Health:** Higher temperature expand some dangerous vector-borne diseases, such as malaria, which is said to kill one million people annually, most of whom are children in the developing world. Also, heat waves associated with climate change, and increase in water borne diseases, will result in increases health problems (Holmes. 2010).
- **Coastlines:** According to Holmes (2010), melting ice and thermal expansion of oceans are the key factors driving sea level rise. In addition to exposing coastlines, where the majority of the human population live, to greater erosion and flooding pressure, rising sea-level will also lead to salt water contamination of fresh water supplies, threatening the quality and quantity of freshwater access to large percentages of the population.

Similarly, Odjugo (1999) reports that one of the greatest impacts of climate change is the worsening condition of extreme weather events like drought, flood, rainstorms, windstorms, landslides, avalanches, and tsunamis among others. Additionally, he notes that population displacement may result in communal crisis; the coastal inundation and erosion with their associated population

displacement are currently major environmental problems. Furthermore, Sayne (2011) notes that Nigeria's climate is likely to see growing shifts in temperature, rainfall, storms and sea levels throughout the twenty-first century. Accordingly, these climate changes, if unaddressed, could throw already resources such as land and water into even shorter supply.

Moreover, poor responses to resource shortages could have serious negative secondary effects, including more sickness and hunger, fewer jobs, and poor economic growth which in turn could open the door to more violence. Indeed, in the few conflict-prone spots such as the Niger Delta and the arid northeast, this sequence is already playing out on a limited scale. Understandably, failure to share limited resources well underlies many violent conduct that dot the country's social landscape, putting neighbour against neighbour, Muslim against Christian, patron against client, citizen against the state.

Conversely, Fabiyi (2011) notes that climate change is not a major factor that impacts vegetation and environmental quality. He rather attributes negative environmental effect to human activities; he observes that settlement developments, oil prospecting over the years amongst other activities imprint indelibly especially in the Niger Delta region of Nigeria.

2.1.1 Climate Change: Nigerian Situation

Nigerian economic programmes are often no stronger than the acts and intentions of their purported champions. Nigeria's Gross Domestic Product (GDP), according to World Bank, is the world's 41st highest but only 161st highest per capita, and during the 2000s, GDP and unemployment rose, paradoxically in near parallel formation. With an annual population growth of 3 per cent - meaning as many as 740 million Nigerians by 2100- these trends cannot be sustained. How much longer can Nigeria rely on growth-poor sectors such as farming for new jobs and economy stability? Making agriculture the future of Nigeria's jobs seems a fool's bet, even if productivity improves and climate change does not bite hard. Right now, Nigeria is the only fast-growing sub-Saharan African country in recent years to have used farming for its growth base, and the young generation does not want the work. Despite costly government incentive-packages, youth involvement have been failing for years as millions decamp for the big cities. 47 years is the average age of today Nigerian farmer (Sayne, 2011). Ideally, market forces will help shift resources elsewhere if climate changes help end Nigeria's competitive advantage in agriculture. This cannot be presumed, though; already many young, uprooted Nigerians are finding big city promises elusive.

Similarly, how will Nigeria handle its shift from primarily rural to an urban society? Around half of Nigerians live in cities already. By 2015, according to United Nations department of economics and social affairs, Lagos will be world's third largest megacity, trailing Tokyo and Bombay, with 23 million inhabitants. Census figures show the population of Kano has grown fourteen fold in 45 years (National Bureau of Statistics). Climate change will be expected to multiply the pressure of rapid urbanization - cutting the food supply, for example, even as urban demand rises. Depending on policy choices and investment partners, a future urban Nigeria could face two divergent paths. Along one, scores of underworked, undeserved, unskilled, and ethically divided youth jostle one another in seething slums; on the other hand, an emerging middle class finds new wellsprings of stability and innovation. This challenge perhaps leads to the most important question facing Nigeria today: what future lies beyond oil? A growing body of research suggest a country's chance of escaping the so called 'resource curse' turn heavily on the investment its public institutions make. If Nigeria is serious about its stated vision of becoming one of the world's twenty largest economies by 2020, how will it build on the gains of 2000s to better leverage its human capital and tremendous entrepreneurial energy? It cannot rely solely on oil, either for jobs or revenue, and analysts expect today's high non-oil growth of 8 per cent to show by mid-decade without a steady flow of new investment and enterprise (Sayne, 2011). The next decade could be very exciting in commercial terms, particularly as high purchasing power among the middle-class spurs double-digit growth in the goods and service sector. Ideally, the government will tender its climate change adaptability strategies to help growth and protect sectors, value chains, regions, and populations; best able to device the country's future development.

2.1.2 Impacts of Climate Change in Nigeria

Nigeria could see serious resource shortages this century if it responds poorly to the issue of climate change, blaming man-made ills risks a poor response. Nevertheless, these impacts could broadly be classified into two viz: Primary and Secondary impacts.

Primary Impacts:

Land scarcity is the first issue here. The combination of more heat and less rain raises the spectre of widespread desertification, especially in northern Nigeria. According to some estimates, fully two-third of Bauchi, Borno, Gombe, Jigawa, Kaduna, Kano, Kastina, Kebbi, Sokoto, Yobe and Zamfara states could turn deserts or semi-deserts in the 21st century (Sayne, 2010). Already the Sahel creeps south by approximately 1400 square miles a year, swallowing the whole villages; government geological data show a 400 percent increase in sand dunes over twenty years. Meanwhile, hydrological modelling indicates that a 1.5-foot sea level rise could submerge more than 11,000 square miles in coastal land. Much of Nigeria's densely populated increasing urbanized 500 mile-long southern coast is less than 20 feet above the sea level; the Delta region with its easily flooded network of estuaries, rivers, creeks, and streams, sits especially low as does Lagos. How far potential land losses overlap with vulnerable assets,

populations, and sectors of high strategic importance needs better mapping. Good analysis will also account for the inefficiencies of Nigeria's byzantine land-use systems and man-made land destruction - the traditional burning of fields by northern farmers for instance, or the Delta's many oil spills.

Water shortage is a second concern. Useable water is at a premium for much of Nigeria. Poor management and government supply failures, not limited availability, are likely the biggest causes today. The UN Food and Agricultural Organization rates Nigeria's water use and conservation practices 'poor' by international and African standards, and only 8 percent of homes nationwide have treated pipe-borne water. Yet climate shift could also factor into some shortages. More heat plus less rain is already creating drought condition in part of northern Nigeria. This is troubling when government data shows rural households harvest rain for more than half their total water consumption and northern groundwater tables has dropped sharply over the last half century, owing partly to less rain. In parts of southern Nigeria, flooding caused by sea level rise is also contaminating fresh water aquifers, rivers, and stock-watering points leaving them with high sanity and more polluted with sediments and sewage.

Climate change may also leave Nigeria increasingly short of at least two types of man-made resources. Sea level rise and severe weather could cause significant property loss. Statistics here are scarce, but 1992 and 2007 wind - and rainstorms damaged or destroyed at least 720 million in economically productive assets across 12 of Nigeria's thirty-six states. Finally, climate change could leave the petroleum- dependent public sector with less oil wealth. Today, 80 percent of all government revenue and 97 percent of Nigeria's foreign exchange come from Niger Delta oil. Some hydrological modelling says 3 feet of sea level rise could put nearly all the Delta's onshore oil field under water. Some industry watchers and officials believe the added production costs, drops in investment and lost or deferred production could be heavy.

2.1.3 Secondary Impacts:

At least four main types of negative secondary impact could follow poor response to climate change - induce resource shortages. First, some population could experience more sickness and death. Nigeria's public health profile is already dismal. Would more polluted water from floods or sea level rise mean increase mortality from malaria, cholera, and heat stress? The World Health Organization (WHO) and International Red Cross have seen troubling illness patterns among survivors of recent severe weather events, as well as Internally Displaced Persons (IDP) camps bursting with refugees from violence. And what are the casualty risks of more severe weather such as torrential rains and windstorms? Government and WHO figures show at least 1600 Nigerians dead in 20,000 floods over a decade.

More human displacement is a second possible impact. Estimate of persons left homeless by severe weather range into hundreds of thousands and resource shortage may be accelerating migration in some parts of the country especially the north. One 2011 study found the home of 9.7 million Nigerians could be vulnerable to rising sea by 2050. Unfortunately, Nigeria does not keep good data on migration, climate change related or not. yet existing figure shows a serious IDP problem. The conflict alone displaced 3 million people between 1999 - 2006, with at least eighty thousand homeless at the end of 2009. Third, poor response to resource shortage could result to more hunger. Food security is a many-headed issue, shaped by such factors as technology, trade policy, and market performance. Nigeria has not suffered the famine woes of its neighbour - Niger or Chad, but its hunger profile is not good and climate change could worsen it. Some 85 percent of all Nigerian agriculture is rain-fed, and many crops are sensitive to even tiny shifts in rainfall and temperature. Some experts already link mounting crop failures and declining yields in the northeast to higher temperature and drought. Where little irrigation exists, it is increasingly stressed. For instance, less rainfall and higher temperatures had helped shrink lake Chad, once the world's sixth largest lake and the north biggest irrigation source, to one-tenth its size a half century ago. The rising sea is always flooding farmland along the southern coast and making soil too salinized for planting. Other reports indicate that more severe rain is causing sheet erosion in the sandy soil of the southeast, again resulting in low yield. All of these occur as the production of staples like maize and yam is already stagnant, productivity per hectare is low by commercial standard and at least four to five million new Nigerians are born each year placing further stress on food sources.

Finally, climate change-related resource shortage could contribute to lower economic growth and more unemployment. Nigeria's human capital is already poorly leveraged; in 2009 the national unemployment rate was 19 percent. No one has modelled climate change's possible effect on the labour market yet. Unemployment has many causes besides weather, yet there is a cause for concern. Nigeria economy relies heavily on weather sensitive occupation; farming, fishing and logging occupy 70 percent of the workforce, contribute over half of the Gross Domestic Product (GDP) and accounts for the majority of jobs created recently. The 2009 DFID study concluded that with a strong response, climate change would cost the country between 6 percent and 30 percent of its GDP by 2050, worth between \$100 billion and \$460. The authors sketch productivity and growth losses in roughly a dozen key sectors and predicted that agriculture's share of GDP could fall 38 percent by mid century without deep investment in adaption. Similarly, the Federal Ministry of Environment has calculated that 3 feet of sea level rise will cost Nigeria \$43 billion dollars in GDP over 30 years.

2.1.4 Conflict Risks:

Another secondary impact is the risks of conflicts. No one knows the full implication of climate change. Some analyses have implicated shifting weather in violent social collapse across the centuries from medieval China to the collapse of the Mayan civilization to recent event in Dafur. 40 percent of intrastate conflict in the last six decades involved disputes over limited natural resources, two dozen of them since 1990. Not all hold link to climate change, but adding resource disputes to the mix generally doubles the average length and relapse rates of civil violence. Conflicts over resources have long been a depressingly familiar part of Nigeria social order. According to one estimate, communal violence most of them involving contested resources, killed at least 10,000 Nigerians in less than a decade. Again, links to climate change can be more or less strong. A case in point is Nigeria's farmer-herder conflict. In a pattern seen across the Sahel since the 30 years drought, feed and water shortage caused partly by desertification and drought have sent nomadic pastoralist, most of them ethnic Fulani, wandering south outside their normal grazing routes. At the same time, a mix of weather-related factors has pushed farmers to cultivate more land each year, leaving wanderers fewer places to water and graze their stocks. The resulting contest may have been responsible for the death of several hundred Nigerians since the return of democracy in 1999. Drawing lines of causation between climate change and conflict require caution. Every conflict has many causes, and people do not automatically start fighting when the weather heats up, their crops shrivel, or their jobs disappear. Policy analysts, the media and the academia also disagree on the magnitude and mechanics of risk. On one side available statistical research says the causal link between climate change and conflicts are subtle, with many contingencies. Against this nuanced view, other voices sound dire, deterministic alarms - arguing, for instance, that change may well represent a challenge to international security just as dangerous - and more intractable - than the arms race between the United State and Soviet Union during the cold war or the proliferation of nuclear weapon among rogue states today. However, there are grounds to believe Nigeria's changing climate change could lead to violence.

Low economic opportunity is the first conflict risk potentially relevant to Nigerian climate. Anger over economic stagnation and joblessness turns up in opinion polls and conflicts narratives across Nigeria. The power of climate change to disrupt economies and eliminate jobs needs closer study, but existing evidence suggest at least two troubling potential links to violence, both involving the young. First, climate change could increase the risks of violence in some areas where youths are especially affected. A full 60 percent of Nigeria's population and three-quarters of its unemployed are under thirty. Evidence in and outside Nigeria suggests that alienated young people who lack resources and economic opportunity are more likely to join rebellions. In the dusty streets of Bornu state's capital, for instance, the violent antiestablishment Islamic group Boko Haram attracts rafts of jobless young men, as do the Delta's many militias and gangs. Second, more jobless youths could deepen the recruitment pool for political violence, often as a survival mechanism. Ideal young men and women already provide the muscle for much of this unrest.

Declining social and economic ties are a second possible conflict risk. Weather-induced shifts in economic opportunity, for instance, could undercut existing trade relationships that act as barriers to violence, leaving mistrust, rumour, and broken agreements in their place. Two examples illustrate the problem; in the south, many farmers now plant over grazing routes long agreed upon with Fulani herders, in some cases leading to violence. Their reasons for doing so are partly climate related: shifts in planting technique driven by changing rains and temperatures have made the dung offer for grazing and watering rights less valuable, and in the Delta, members of one coastal fishing community recall that a long- running land dispute with the farmer neighbours turns bloody after the rising sea stunted the neighbours' rice crops. Indeed, these ugly incidents are endless.

2.1.5 Summary of suggested Nigeria's Initiatives and Responses

The federal government has not done much on climate change thus far. Nigeria's first national communication on climate change came out in 2003; President Olusegun Obasanjo set up a special climate unit in the Ministry of Environment to manage the issue. State governments have largely been unengaged, with the arguable exception of Lagos. A central policy organ and knowledge centre should help coordinate Nigeria's response to climate change. The crosscutting nature requires a joint effort, and the prevailing state of Nigeria's political economy argues for a central actor to help leverage and keep patronage logic at bay. This federal body shall have the statutory power and influence to coordinate planning and cooperation on climate change among all stakeholders and to device a central climate change policy for Nigeria. It should also serve as the country's main climate change knowledge centre and manage ongoing research. Also the body should oversee donor and multilateral funding as well as develop necessary domestic funding mechanism to get money to sub national actors.

The government should increase the capacity and involvement of other sister agencies to contribute to the development of adaptation policy. These include the National Emergency Management Agency, the Nigerian Meteorological Agency, the National Environmental Standards and Regulations Enforcement, the National Institute of Freshwater fisheries Research, the National Water Resources Institute, Kaduna, the National Centre for Arid Zone Studies, Maiduguri, etc.

There is a growing need for better information of all existing data on potential climate change impacts and associated conflict risk.

Then government should commission analyses of the potential effect of climate change on specific sectors, value chains, population, and regions of high strategic importance, and then assesses the feasibility and cost effectiveness of particular adaptation measures.

Finally, Nigeria needs and deserves the help of more developed nations on climate change. Adaptation will cost. Good numbers for Nigeria do not exist yet, but differing models set worldwide adaptation cost at anywhere from \$50billion to \$380billion per year by 2030. Some key measures - coastline protection, for instance - can be especially costly. As a major source of emission, the world's rich nations are also obligated, not least under UNFCCC to help countries like Nigeria. This is not a question of Aid, and amount should be budgeted over and above overseas development assistance.

3.1 Conclusion and Recommendation

Strong leadership, relationships, individual choices, and cooperation will decide much of climate change and conduct play- out together in Nigeria. Solid engagement is key to achieving best outcomes. Even if most work ends up being done privately, adaptation remains a suitable and necessary public policy choice, and because some measures - flood barriers for instance - are public goods best supplied through joint action. What is needed is an honest and open debate about how to build a resilient society. With its complete federal structure, neo-patrimonial leadership tendencies, low political accountability, and communication defects, Nigeria will not easily enter such a debate.

First, response could be to protect existing resources: the government, for instance, could fund the construction of lakes or to keep communities from flooding. Second, adaption could provide new resources; officials could resettle a flooded agricultural community along the coast to some uncontested upland area, for example, or provide farmers with seed that thrive in saline, least mineral-rich soil.

Third, government could offer new rules and models for managing shared resources. This approach could include introducing cooperatives based on contested turf or setting up new dispute resolution mechanism. Both efforts could reduce resource shortages and their secondary impacts and open up social spaces for improving relationships and reviving institutions.

Finally, adaptation takes the form of education. Government or private actors could give those affected by climate change information or better resource management on the destructive effect of resource contests.

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