

CLIMATE CHANGE AND ITS IMPACTS ON THE DEVELOPMENT OF COASTAL COMMUNITIES IN NIGERIA

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Abstract

Climate change poses a greatest challenge to community development such as flooding, dew, humidity, haze and cloud, to mention a few. Climate change is a global challenges affecting every segment of the society. It appears people in the rural areas are better off because the live closer to nature. The study made use of sample size of 64 people living at Eti-Osa Local government Lagos State. The data collected from the questionnaire and interview were coded using Non parametric technique of Z-score analysis. The finding reveals that climate change threaten the livelihood of people in coastal communities and serve as setback progress to human development with negative implications for political and socio-economic arrangement. The study recommends among others that Federal government should adequately equip and empower local government to tackle any disaster with dispatch efficiency arising from climate change. The study concludes that the drive to develop coastal community programmes that are sustainable in the context of climate change policy is implemented at all levels of government.

Keywords: Efficiency, Sustainable, Humidity, Flood, Programmes.

Introduction

Global warming is not the only problem now facing mankind, but it is one of the most serious with which humanity has ever been confronted (Adeniji, 2010). Others such as overpopulation as predicted by Malthus in the 19th century did not occur as forecast, Water shortages, already plaguing many regions of the world. This has become a new reality with harmful impacts. Many elements of the environment and the human society are sensitive to climate variably and change

Climate change has affected virtually every human life in contemporary society has also brought daunting challenges to virtually all facets of life in contemporary society, including, of course, economic development (Fatile, 2013). Climate change results in fundamental transformation of physical and social life of people. Nigeria government has not be able to tackling the challenges of new adaptation to altered climate conditions incoastal communities and changes in lifestyles resulting from destruction of existing social structure and

infrastructures. These challenges become more obvious in a developing economy like Nigeria (Yusuf, 2012). Numerous studies have focused on different aspects of climate change impacts and adaptation needs in Africa, but few have considered the effects of climate change on the coastal development at national and regional levels.

Nigeria, a nation estimated as over 150million people (NPC, 2006) shoehorned into an area twice the size of California and confronting deep ethnic divisions, development, challenges, and a history of poor leadership, already struggles to meet its resource needs and wants. Climate change may worsen existence social, economic and political challenges, particular for those societies that are dependent on resources that are sensitive to climate change (Buhari, 2015) . Nigeria's climate is also likely to see growing shifts in temperature, rainfall, storms and sea levels throughout the twenty-first century (BNRCC, 2014). These climate challenges, could throw already stressed 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, in either rural or urban centre. Indeed, in a few conflict prone spots such as the Niger Delta and the arid northeast, this sequence is probably playing out on a limited scale already (Akilola, 2010).

Nigeria needs to consider the potential of climate to fuel violence as the country figures out how to adapt. Although inadequate analysis has clouded the picture of how climate change will affect Nigeria's environment in coastal communities and experts are optimistic that without intelligent, even-handed responses, the impacts of climate change could compound the risks of conflict (UN, 2007).

Statement of problem

In Nigeria as in many parts of the Africa climate change could include greater and more rapid sea level rise than previously projected, and more frequent coastal storms, threatening the lives and livelihoods of coastal communities; the increased incidence of extreme weather events; substantial reductions in surface water resources leading to accelerated desertification in sensitive and zones; and greater threats to health (such as malaria), biodiversity (including bleaching of coral species on the African tropical reef systems) and agricultural production a predicted decline of 12 per cent in production in Nigeria by 2020 (Jimoh, 2008).

The Nigeria borders are demarcated by river channels and basin watersheds, and most major rivers traverse national boundaries. These are sensitive to even moderate reductions in rainfall as are projected for much of northern western and southern state. Such reductions could lead to an increase in inter-communal and inter-state conflicts over scarce water resources and threaten the sustainability of hydro-electric power generation (Majekodunmi, 2015)

Projected significant reductions of perennial surface water in southern Africa by the end of the century could threaten key ecological and livelihood resources, such as the Okavango Delta in Botswana, and large urban centers, such as greater Cape Town. Acidification and greater extremes of climate potential extinctions of endemic species and disruption of physical ecosystems – such as the remobilization of Kalahari dune systems represent only a few of many significant projected impacts on local sustainable livelihoods and ecological resources.

The projected impacts of unmitigated climate change in Nigeria are likely to have significant impacts on human livelihoods, health, water resources, agricultural production and food security as well as nature-based tourism (Fatile, 2013). All would undermine economic

prospects across much of the states. Indeed, most SMR in Nigeria are among those least able effectively to respond to, and cope with these adverse effects .Majekodunmi (2015) noted that climate change sensitive systems are ecosystems, agriculture, need and supply water, food production , among others. Some observed changes may includes: fierce weather, increase reguency and intensity of storms, flood, hurricanes, droughts, socio-economic and political problems associated to these are poverty , malnutrition, health and civil unrest caused by scarcity of agricultural land and mining land of environment resources as can be seen in coastal region of Nigeria.

Many people in Nigeria already live on the front liens of poverty, pollution, disaster, and degradation. Their livelihoods and food security depend directly on agriculture, forestry and fisheries. Their economies will suffer most from the heightened frequency of drought, floods and storms associated with climate change. Indeed, there is a real risk that climate change could erect new obstacles in the way of achieving the Millennium Development Goals.

Objective of the study

The main objective of this study is to examine climate change and its impacts on community development in Nigeria. Other specific objective includes.

1. To examine the extent to which climate change threatening the livelihood of coastal communities in Nigeria.
2. To investigate how climate change decline natural; resources in coastal communities in Nigeria.
3. To suggest solution to the challenges.

Research Questions

1. To what extent Couldclimate change threatening the livelihood of coastal communities in Nigeria?
2. Does climate change decline natural resources in coastal communities in Nigeria?

Research Hypothesis

Ho: Climate change does not threatening the livelihood of coastal communities in Nigeria.

Hi: Climate change threatening the livelihood of coastal communities in Nigeria.

Ho:Climate change does not decline natural resources in coastal communities in Nigeria

Hi: Climate change decline natural resources in coastal communities in Nigeria

Literature Review and theoretical Framework

Climate change is increasingly an everyday reality. The growing intensity and frequency of droughts, floods, extreme weather events, and other impacts speak loudly for the need to deal with this real and serious threat (Fatile, 2013). The international response to climate change has evolved around the United Nations Framework Convention on Climate Change and its Kyoto Protocol, which together provide the institutional basis for action on a global scale (UN, 2007). The latest round of international talks – the United Nations climate Change Conference in Nairobi deals with important issues for advancing international action to mitigate the causes of climate change and to adapt to its impacts.

Allen (2004) sees climate change as a complex interaction between Earth's atmosphere-stratosphere and troposphere on one hand and land biosphere on the other hand. Climate change is believed to result from the effects of global warming on the environment. Global warming is regarded by many people to be the most serious environmental challenge in the rural and urban cities (Gideens, 2006).The intergovernmental Panel on Climate Change

(2007) defines climate change as a change in the state of the climate that can be identified by changes in the mean or the variability of its properties, and that persists for an extended period – typically decades or longer. Although the length of time it takes the changes to manifest matters, the level of deviation from the normal and its impacts on the ecology are most paramount. The United Nations (2007) defines climate change as a change of climate which is attributed directly or indirectly to human activity that alters the composition of the global atmosphere and which is in addition to natural climate variability observed over comparable time periods. The major characteristics of climate change. According to Fatile (2013) include rise in average global temperature, ice cap melting, changes in precipitation, and increase in ocean temperature leading to sea level rise.

Ozor (2009) sees climate change as change in the climate over time, whether due to natural variability or as a result of human activity and is widely recognized as the most serious environmental threat facing our communities today. This definition elicits the seriousness of the threat posed by climate change and the urgency of the need for countries to rise up to this urgent clarion call of combating the negative effects of climate change.

Climate change has contributed a great threat to rural and urban socio-economic and landscape as well as implementation of scientific findings towards the advancement of the community development in Nigeria. It is shaping the natural landscape in the long-run and the modern planned of rural and urban social and economic environment. This has become a new reality with harmful effect. Many elements of the environment in the urban and rural and the human society are sensitive to climate variability and change. Examples of climate sensitive systems are ecosystems, agriculture, water needs and supply, food production, among others (Okoye, 2007). Some observed changes may include: fierce weather, increased frequency and intensity of storms, floods, hurricanes, droughts. Socio-economic and political problems associated to these are poverty, malnutrition, health and civil unrest caused by scarcity of agricultural land and mining land of environmental resources as can be seen in the Niger Delta region in Nigeria.

Climate change is the variation in global or regional climates over time. It reflects changes in the variability or average state of the atmosphere over time scales ranging from decades to millions of years. These changes can be caused by processes internal of the earth, external forces (such as, variations in sunlight intensity) or, more recently, anthropogenic activities (arctic Climatology and meteorology, 2008). In recent usage, especially in the context of environmental policy, the term “climate change” often refers only to change in modern climate, including the rise in average surface temperature known as global warming (Adeniji, 2010:48). In some cases, the term is also used with a presumption of human causation, as in the United Nations Framework Convention on Climate Change (UNFCCC), the UNFCCC uses “climate variability” for non-human caused variations.

Theoretical Framework

Theories help us simplify difficult concepts and explain reality. By simplifying concepts and identifying the core elements, it then becomes easier to explain events and the implications of these events. We utilize Integrated Rural Development Theory. In Igbokwe-Ibeto (2003) the concept of integrated rural development as that of total transformation of the lives of rural populace. According to him, integrated rural development is the process of taking development and concrete action to ensure the positive transformation of the productive forces of the rural populace and the exploitation of the rural resources for their common goals. The theory went further to analyse the operational linkages between government and the coastal communities on the impact of climate change in their environment. Hence, the

needs for government effort on sensitive and mass education of coastal communities to climate variability and change.

In relation to climate change and its impact on the development of coastal communities, the principal, which is the government, is bound to protect the interest of the rural communities in the provision of essential services, and to protect them against natural disaster like climate change which seriously affects the citizen in recent times.

Climate Change and Coastal Community Development in Nigeria: The Nexus

Nigeria, as a developing nation, is particularly sensitive to the effects of climate change. The economy of the country depends on natural resources, which are particularly vulnerable to climate change. Disease, loss of livelihoods and settlements can force entire communities into relocation or complete extinction and even refugees status, as critical as the impact of climate change is, Nigerians are not aware of what climate change is or its impacts. Perhaps the biggest obstacle is the lack of awareness and knowledge. According to Adeniji (2010) Nigerians need to be educated and informed about climate change and how it can impact our lives drastically. For instance, the former Lagos state governor RajiFashola in 2014 has warned about the likely effects of Hurricanes Sandy on the State. The Nigerian Meteorological Agency has also warned of more natural disasters ahead caused by unfavourable weather conditions. Experts recently warned that preparedness is vital in the event of man-made and natural disasters (Punch, 2015).

Climate change is an environmental, social and economic challenge on regional and scale (Scholze Annel and Prentice, 2006; Mendelsohn Dinnar and William, 2006). It can be exacerbated by human-induced actions such as: the widespread use of land, the broad scale deforestation, the major technological and socioeconomic shifts with reduce reliance on organic fuel, and the accelerated uptake of fossil fuels (United Nations, 2007). It is instructive to note that the frequent price increase and scarcity of basic domestic fuels like kerosene is likely to have a significant effect on government's afforestation programmes in Nigeria. Nigerian environmental groups have discovered that massive deforestation of the nation's severely depleted forest may follow if frequent fuel price increase is not addressed (Raufu, 2003).

According to Fatile (2013), the most devastation adverse impacts of climate change in Nigeria and other subtropical countries include the following: frequent drought, increased environmental damage, increased infestation of crop by pests and diseases, depletion of household assets, increased rural urban migration, increased biodiversity loss, depletion of wildlife and other natural resource bases, changes in the vegetation type, decline in forest resources, decline in soil conditions (soil moisture and nutrients, increased health risks and the spread of infectious diseases and changing livelihood systems(Ozor, 2009).

Climate change has been attracting serious interest among the globe due to its impact on the weather and natural resources as well as agriculture. From decade to decade, change in the climate has continued to be evident. Since the start of the 21st century, the world has been witnessing the warmest in the instrumental weather record. Normally, climate change can be described as part of the Earth's natural variability. It is a subject of the connections among the atmosphere, ocean and land, as well as changes in the amount of sola radiation reaching the Earth. From country to country, community to community, challenges mounted by change in climate cannot be underestimated (Kasali, 2011).

The formal Lagos State commissioner for Waterfront Development and Infrastructure, Adesegun Oniru, in 2014 noted that the State government is planning to protect Majidun, Kuramo, Oniru and Alpha beaches and other areas prone to ocean surge in Lagos. Although

Nigeria has not had any serious natural disaster in the magnitude of a hurricane or tsunami, the worst we have had being flooding. In both past and present indicate that beyond the government's alert and promises, the country is not really prepared for serious natural disasters. A recent example is the Kuramo ocean surge in Lagos. When this incident occurred, rescue efforts were late in coming while some Kuramo victims failed to heed the warnings concerning the looming danger (The Punch, 2014). Also, beyond the warning about the recent flood which claimed many lives and property across the country, the best the Federal Government has done has been to set up a committee to source relief for the victims.

Challenge of Climate change and Coastal Community Development in Nigeria

Climate change is a topical issue worldwide because of its attendant problems that are threatening the sustenance of community development. In recent times, they have become particularly severe in Nigeria, bringing with them grievous consequences. The impact of climate change includes floods, landslides, drought and famine. As weather becomes fiercer and storms increase in frequency and intensity, serious socioeconomic consequences result. Malnutrition and disease become common occurrence (Fatile 2013:94). Multifarious impacts of climate change, the biggest obstacle is lack of awareness about it, as Nigerians still need to be educated and informed about it (Wangwe, 2010).

Climate change has been one of the most engaging environmental subjects of debate in recent times. Indeed, the environmental problems associated with the potential impact of expected climate change may prove to be among the major environmental problems facing many communities. In Nigeria, it has been realized that serious environmental problems arise in association with global warming resulting from emissions of greenhouse gases into the atmosphere. These problems in one way or another affect the location and planning of features and economic activities in Nigeria (Onyenechere, 2010)

There has been growing concern over climate change and its impacts on community development in Nigeria. The quest of every government includes; maintenance of law and order, provision of basic infrastructures and ensuring accelerated socioeconomic development, among others. Each of these requires and enabling social, political and physical environments (Yusuf, 2012). The current spate of environmentally induced havoc ravaging many parts of the globe effecting communities development concern to governments, organizations, scholars and stakeholders in environmental issues. The devastation caused by super storm Sandy in some parts of the United States in October, 2012 is a wake-up call on developing countries like Nigeria. Hurricane Sandy came in the heat of campaigns for the U.S presidential elections. There had been adequate warnings about the advancing storm that had wreaked havoc in the Bahamas, Cuba, Dominican Republic, Haiti and Jamaica. Yet when it hit the U.S, it was a devastation blow (Fatile, 2013).

In Nigeria, through relatively lucky with nature experienced a flood disaster in November 2014 which led to great devastation of lives and properties. The Federal Government, through the ministries of environment and internal affairs, as well as the National Emergency Management Authority (NEMA), have taken some measures in addressing the flooding problem that has ravaged some parts of Nigeria especially in Lagos which many houses have yearly been submerged by floods, rendering hundreds of residents homeless and valuable properties destroyed (The Punch, 2014)

Research Method

This research work adopts survey research method and made use of primary and secondary data through the use of the instrument of questionnaire and survey interview. A structural questionnaire was designed in a closed and opened ended form and was administered to the

respondents. Questionnaire was used because it foster and can generate comparable and quantifiable data. The respondents constituted the data based on the study. The study used focused group and interview 220 of community people living in coastal area that is; Eti-Osa Local Government in Lagos state. The sample for the study was made up of 66 people from the 220 population. The sample size amounted to 30% of the total population. Data collected from the questionnaire and interview were coded using Non-parametric techniques of Z-scores analysis.

Data Presentation and Analysis

Responses that were relevant to the objectives and hypotheses were used. The method applied in the analysis is by testing the hypotheses formulated with the Z-Scores techniques analysis.

Ho: Climate change does not threatening the livelihood of coastal communities in Nigeria.

Ho: Climate change does not threatening the livelihood of coastal communities in Nigeria.

For the purpose of gathering data, a close ended questionnaire was used. The data collected were analyzed using simple percentage and Z-Scores non-parametric Techniques. It computed as follows:

$$Z = \frac{P_n - P_o}{\sqrt{\frac{P_o(1-P_o)}{n}}}$$

$$Z = \frac{P_n - P_o}{\sqrt{\frac{P_n Q_n}{n}}}$$

Where Z = Z-Score

P_n = Proportion of Positive responses

P_o = Probability of either outcome

n = Number of sample population

The data collected through the questionnaire from the people living in coastal communities in Eti-Osa local government in Lagos state on the topic: Climate Change and its impacts on development of coastal communities in Nigeria.

Sixty-four questionnaires were properly filled returned. This represent 85% which is enough for this research work.

Respondents Responses

Question 1: To what extent Could climate change threatening the livelihood of coastal communities in Nigeria?

Respondents	Frequency (F)	Percentage (%)
Agree	45	70.3
Disagree	19	29.7
Total	64	100

Source: Questionnaire survey, 2015

The above table shows that employees with 45 (70.3%) respondents agree to the statements and 19 (29.7%) disagree. This indicates that climate change threatening the livelihood of coastal communities in Nigeria.

Question 2: Does climate change decline natural resources in coastal communities in Nigeria?

Respondents	Frequency (F)	Percentage (%)
Agree	40	62.5
Disagree	24	37.5
Total	64	100

Source: Questionnaire survey, 2015.

The above statement indicates that 40 (62.5%) agreed while 24(37.5%) disagreed with the statement. This shows that climate change decline natural resources in coastal communities in Nigeria.

Test of Hypotheses

Hypotheses one

Null Hypotheses (Ho): Climate change does not threatening the livelihood of coastal communities in Nigeria.

Alternative Hypotheses (Hi): Climate change threatening the livelihood of coastal communities in Nigeria.

To test the above hypotheses, question 1 in the questionnaire analyses based on the respondent’s responses. This is shown in the table 1 above using 5% (0.05) level of significance.

$$Z = \frac{P_n - P_o}{\sqrt{\frac{P_n Q_n}{n}}}$$

Where $P_n = 0.45$

$$P_o = 0.05$$

$$n = 64$$

$$Q_n = (1 - P_n) = 1 - 0.45 = 0.55$$

$$Z = \frac{0.45 - 0.05}{\sqrt{\frac{(0.45)(0.55)}{64}}} = \frac{0.35}{\sqrt{\frac{0.2475}{64}}}$$

$$= \frac{0.4}{\sqrt{0.003867}} = \frac{0.4}{0.0621} = 6.44$$

Z -Score calculated (Zc) = 6.44

Hence Zc = 6.44 while Zt = 2.35 @ 0.05 level of significance

Interpretation: If $Z_c > Z_t$ = Accept Hi; Reject Ho;

IF $Z_c < Z_t$ = Accept Ho; Reject Hi

Decision: From the above Z-score Analysis.

Z-Score calculated (Zc) is greater than Z-score tabulated (Zt) i.e. 6.44 is greater than 2.35 respectively. This indicates that climate change threatening the livelihood of coastal communities in Nigeria.

Hypothesis Two

Null Hypotheses (Ho): Climate change does not decline natural resources in coastal communities in Nigeria

Alternative hypotheses (Hi): Climate change decline natural resources in coastal communities in Nigeria

To test the above hypotheses, question 2 in the questionnaire is analyzed based on the respondent’s responses. This is shown in the table above using 5%(0.05) level of significance.

$$Z = \frac{P_n - P_o}{\sqrt{\frac{P_n Q_n}{n}}}$$

Where $P_n = 0.4$

$$P_o = 0.05$$

$$n = 64$$

$$Q_n = (1 - P_n) = 1 - 0.4 = 0.6$$

$$Z = \frac{0.4 - 0.05}{\sqrt{\frac{(0.4)(0.6)}{64}}} = \frac{0.35}{\sqrt{\frac{0.24}{64}}}$$

$$= \frac{0.35}{\sqrt{0.00375}} = \frac{0.35}{0.0612} = 5.72$$

Z-score calculated (Z_c) = 5.72

Hence $Z_c = 5.72$ while $Z_t = 2.35$ @ 0.05 level of significance

Interpretation: If $Z_c > Z_t$ = Accept H_1 ; Reject H_0 ;

IF $Z_c < Z_t$ = Accept H_0 ; Reject H_1

Decision: From the above Z-score Analysis the Z-Score calculated (Z_c) is greater than Z-score tabulated (Z_t) i.e. 5.72 is greater than 2.35 respectively. This means that climate change decline natural resources of coastal communities in Nigeria.

Discussion of Findings

Based on the findings, the following were revealed.

- i. Climate change threatens the capacity of community people to provide for their own livelihoods.
- ii. It revealed that climate change sets back progress in human developments with negative implications for political, social and economic arrangements.
- iii. The finding is consistent with work of Fatile (2013), Climate change such as floods, hurricanes, droughts pose danger to public service delivery in Nigeria.
- iv. Flooding affects the homes of thousands of people who lives in river areas, in Lagos, thereby risk of loosing facilities is very high.
- v. Climate change destroy or reduce the quality of the local natural resource base upon which current livelihoods depend.
- vi. It can be concluded that global climatic warming pose a serious threat to current social organization and the capacities of people to generate a livelihoods.

Conclusion

The nation environment and natural resources are currently not being exploited and managed in a sustainable manner environmental data collection is not coordinated and hence cannot be used to create an environmental information database which is a prerequisite for a meaningful and sustainable environmental management (Atitola, 2010).

Climate change is visible its impact on community development and human life are palpable. But developing nations such as Nigeria has not put in place any sustainable policy measure to respond to this phenomenon. In Lagos State, it has been observed that degradation of gardens/forests and bush burning have collectively robbed the state of natural resources and environment.

In other for nation like Nigeria to prevent the effects of climate change in our community, serious adaptation measures must put in place. There is the need to establish better equipped weather stations against the scarcity and ill-equipped ones we currently have in Nigeria.

Governments needs to ensure that her current effort at producing a climate policy is quickly brought to conclusion and that the policy is implemented. The federal government should take the lead in integrating the states into efforts to combat the challenges of climate change. Good energies between policy makers, scientist, the citizens and other stakeholders should be promoted at all levels of governance in the country. A holistic approach that will include a climate change information systems, flood risk analysis and operational adaptation strategy, with emphasis on increasing peoples resilience, should be put in place.

Recommendations

This study on climate change and its impact on the development of coastal communities in Nigeria. It reveal the negative of climate change and the threatening the capacity of people to provide their own livelihoods. Based on the findings from the study the following were recommended;

- The need for individuals and communities involvement to adopt behavior geared towards restoring and conserving the environment, increase self-reliance, avoid unregulated forest exploitation and plant trees.
- Forest can be curbed by global warming through aforestation, reforestation, reduce deforestation, increase the use of forest product such as bio-energy and durable wood products based.
- The government at all levels that is; Federal, State and local governments must get involved in preparing for the impact of climate change and reducing green housegas emissions. Environmental Protection Agency should sensitize the public on the impact of climate change in their environment
- Finally, adaptation of climate change is imperative by an adjustment in ecological, social and economic system in response to observe or expected changes in climatic stimuli and their effect in other to alleviate adverse impact of change or take advantage of new opportunities. Hence, adaption is continuous stream of activities, actions, decisions, and attitudes that inform decision about all aspects of life and that reflects existing social norms and processes (BNRCC, 2014).

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