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Climate change, environmental security and displacement in Nigeria: Experience from the Niger Delta Flood Disaster, 2012

Luke Amadi* and C. U. Mac Ogonor

Department of Political Science and Administrative Studies, University of Port Harcourt, Nigeria.

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The coastal regions of Africa are prone to series of environmental disasters arising from vulnerability of climate change. The October 7th and November 3rd, 2012 coastal floods in the Niger Delta region Nigeria, provides an evidence of the persistence and inevitability of climate change vulnerability which has been an issue of global concern with potential for havoc on human existence including environmental security, displacement and their far reaching consequences. Using primary and secondary data sources, the paper foreshadows the imminent dangers of climate change vulnerability. It deployed a participatory methodology through focused group discussions (FGDs), questionnaires and oral interview guide as primary data sources. While secondary data sources included relevant authoritative reports from National Emergency Management Agency (NEMA), UNDP, UNEP, newspapers, magazines and documents published by governmental and Non-Governmental Organizations (NGOs). The sampling technique was largely purposive due in part to the sensitivity of the issues investigated. Two open-ended questionnaires were used to elicit two types of information on coastal flood, environmental security and displacement within the purposively selected areas of study namely; Bayelsa, Delta and Rivers States. The findings suggest that the 2012 flooding negatively affected the region with evidence of displacement, out migration, impoverishment, food production decline, etc. The paper made some policy recommendations on mitigation of climate change vulnerability.

Key words: Climate change, environmental security, development, Niger Delta, Nigeria.

INTRODUCTION

The African coastal zone consists of a narrow, low-lying coastal belt. It also includes the continental shelf and coasts of 32 mainland countries. It is composed of a variety of ecosystems, including barrier/lagoons, deltas, mountains, wetlands, mangroves, coral reefs and shelf zones. These

ecosystems vary in width from a few hundred meters (in the Red Sea area) to more than 100 km, especially in the Niger and Nile deltas. In west Africa (Mauritania to Namibia), the coastal zone spans a broad range of habitats and biota and includes the pristine islands of

*Corresponding author. E-mail: madils007@yahoo.com.

Bijagos Archipelago; the offshore island nations of Cape Verde and São Tomé and Príncipe; and the remote central Atlantic islands of San Helena and Ascension (IPCC, 2007).

A large percentage of West Africa's urban population lives in coastal cities. In Nigeria, for example, about 20 million people (22.6% of the national population) live along the coastal zone; about 4.5 million Senegalese (66.6% of the national population) live in the Dakar coastal area. About 90% of the industries in Senegal are located within the Dakar coastal zone. 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. Coastal areas also form the food basket of the region. Offshore and inshore areas, as well as estuaries and lagoons, support artisanal and industrial fisheries accounting for more than 75% of fishery landings in the region (IPCC, 2007).

Similarly, the coastal zone of East Africa, including coastal wetlands, extends from Sudan to South Africa and includes the near-shore islands off the coast of Tanzania and Mozambique and the oceanic islands of Madagascar, the Seychelles, Comoros, Mauritius and Reunion. The desert margins of the Red Sea feature some of the richest coral reefs in the world. Coral reefs further south, extending from Kenya to the Tropic of Capricorn, are well distributed around most of the oceanic islands. They buffer the coastline against the impact of wave breakers and the full force of storms and cyclones. Many principal east African cities are located inland. Despite their low densities, however, coastal cities like Dar es Salaam and Mombasa are experiencing annual population growth of 6.75 and 5%, respectively (World Bank, 1995a). Coastal tourism and fisheries represent large inputs into the GNP of east African states (IPCC, 2007).

In recent times, environment and security discourse have emerged as a central policy concern for countries across the world. This has been under consideration since the 1980s mainly by two groups: (1) the environmental policy community, addressing the security implications of environmental change and security, and (2) the security community, looking at new definitions of national security, particularly in the post-Cold War era. With the surge in environment and security challenges, the General Assembly officially introduced the concept of security and environment at its 42nd session.

The 90s and 2000s revealed increasing vulnerability of climate change such as recent environmental disasters namely; the Japanese Okushiri, Hokkaidō tsunami which struck Okushiri Island of Hokkaidō on July 12, 1993, the 2004 Indian Ocean tsunami with over 230,000 people killed in 14 countries bordering the Indian Ocean, the US Atlantic hurricanes (Andrew, 1992; Katrina, 2005; Irene, 2011) Sandy flood, 2012 and the Haiti earthquake; In West Africa, the most recent severe floods in the coastal

regions of Nigeria on 2nd November 2012, etc (Amadi, 2012).

There are several perspectives in recent literature on environmental security discourse (Mathews, 1989; Homer Dixon, 1992; Awosika et al., 1992). The 1990s witnessed a paradigm shift to human security (UNDP, 1994; Klare, 1996).

Adibe (1994) had examined the change, security had assumed in recent literature encompassing "security expansionism". Suhrke (1995) argued on "environment change, migration and conflict". Her treatise is premised on terminological shifts in line with social changes and transformations in environment and conflict discourse.

Homer-Dixon (1991) identified "gaps" among the poor countries to meet environmental demands which could result conflicts unlike rich countries. He observed that the rich countries have the potential for a widening gap between demands on the state and its financial ability to meet these demands- a gap which he argued could lead to internal conflict between competing ethnic groups or significant out-migration to countries better able to cope with environmental stresses.

Choucrist (1994) argued that environmental degradation forces people to move, sometimes across borders and more assuredly to impinge on and ultimately challenge those (host) populations, thus becoming a key element of conflict.

Suhrke (1995) identified four principal ways pressure on the environment has affected security of the state. They are: (1) environmental degradation can cause health hazards or jeopardize the economic livelihood of a significant part of the population; (2) intensified competition for declining or degraded resources can create conflicts within or among States: these in turn can generate regional instabilities that affect nations further afield; (3) environmental degradation may force people to migrate, thereby creating conflict over scarce resources in the receiving areas; and (4) the existentialist argument advanced by a school of environmentalists and "ecological economists" to the effect that an environmental resource has an intrinsic value regardless of its being consumed (even in the form of being seen), and hence its loss is a matter of security (Suhrke, 1996).

Kaplan (1994) re-echoed the persistent environmental degradation and deforestation in West Africa. He writes that in Sierra Leone, Guinea, Ivory Coast and Ghana, most of the primary rain forest and the secondary bush is being destroyed at an alarming rate. He reports that he "saw convoys of trucks bearing majestic hardwood trunks to coastal ports". (p.48)

In 1987, the World Commission on Environment and Development linked security with environment as foreshadowed in the Brundtland Report:

Humankind faces two great threats. The first is that of a nuclear exchange. Let us hope that it remains a diminishing prospect for the future. The second is

that of environmental ruin world-wide and far from being a prospect for the future, it is a fact right now (Bruntland, 1987).

These terms are marginalized in policy discourse or at the best superficially addressed in the poor countries. Thus, environmental security and climate change issues seem not to have been prioritized in development discourse especially in the coastal regions of Africa such as the Niger Delta region in Nigeria.

Issues of displacement in the region now take various forms such as in and out migration, flood induced displacement, acid rain and oil spill, to crisis induced displacement, etc.

Ibeanu (1998) observed the continued marginalization of displaced persons in Nigeria; "the proclivity among the displaced is rarely to contest their predicament. Only in a few celebrated cases, like that of the Bakolori peasants who were displaced by a dam in the 1980s and the Ogoni whose livelihoods are threatened by oil exploration, have internally displaced people organised and effectively put their condition on the political agenda. The lack of organization among displaced people generally serves to keep their plight concealed".

In 1999 was the adoption of the United Nations Framework Convention on Climate Change (UNFCCC) which was aimed to develop a global framework on climate change. The coastal areas in Africa are fraught with environmental challenges and flood related disasters. The East African floods of 1998 and the Mozambique floods in early 2000 and 2001 caused considerable damage to property and infrastructure. The major infrastructure damage was road and rail network damage. Communications among human settlements in Kenya, Uganda, Rwanda and Tanzania were seriously disrupted, impeding movement of goods and persons in the region (AEO, 2002).

Aspects of coastal erosion have been examined in recent literature (Ibe and Quelennac, 1989; Awosika et al., 1992; Dennis et al., 1995; French et al., 1995). For instance, the occurrence of coastal erosion has been reported in the Niger Delta by Okon and Egbon (1999). The report of Udofa and Fajemirokun (1978) showed a rise in sea level along Nigerian coastal water. They conducted a mechanical analysis of tide data from 1960 - 1970 and reported mean sea level rise to be 0.462m above zero level of the tide gauge which have been of increasing concern in the region.

In 2007, the Fourth Assessment Report of the Intergovernmental Panel on Climate Change (IPCC) predicted that rising global temperatures will contribute to an upsurge in severe storms, floods, droughts, glacier melt and sea level rise. In vulnerable areas of the developing world, extreme weather is expected to intensify pressures on land and water resources, disrupt agricultural production, and threaten food security. In the wake of the IPCC report, a number of policy studies

concluded that there is a strong likelihood that the natural hazards and environmental stresses associated with climate change will trigger or amplify conflict, especially in vulnerable or unstable areas of the developing world (CNA Corporation, 2007; Campbell et al., 2007; Smith and Vivekananda, 2007; Fingar, 2008; UN, 2009).

Among the projected scenarios were severe resource scarcity, dramatic increases in internal and external migration, disease outbreaks and a host of destabilizing social and political effects (Campbell and Weitz, 2008). The CNA Corporation envisioned a confluence of factors that might overwhelm weak or flawed systems of governance and public institutions, setting the stage for "internal conflicts, extremism and movement toward increased authoritarianism and radical ideologies" (CNA Corporation, 2007.)

The Nigerian Environmental Study/Action Team (NEST), reported that sea-level rise and repeated ocean surges will not only worsen the problems of coastal erosion that are already a menace in the Niger Delta, the associated inundation will increase problems of floods, intrusion of sea-water into fresh water sources and ecosystems destroying such stabilizing system as mangrove, and affecting agriculture, fisheries and general livelihoods (NEST, 2004).

The Niger Delta is the product of both fluvial and marine sediment build-up since the upper Cretaceous period, some 50 million years ago. Over time, up to 12,000 m of shallow marine sediments and deltaic sediments have accumulated, contributed mainly by the Niger River and its tributaries (UNEP, 2011).

The coastal area comprises three vegetation zones: (i) beach ridge zone, (ii) saltwater zone and (iii) freshwater zone. The beach ridge zone is vegetated by mangroves on the tidal flats and by swamp trees, palms and shrubs on the sandy ridges. The saltwater zone is mainly vegetated by red mangrove (*Rhizophora mangle*). The coastal plain and freshwater zone is vegetated by forest tree species and oil palm. The Niger River floodplains are covered by rainforest trees, oil palm, raffia palms, shrubs, lianas, ferns, floating grasses and reeds (UNEP, 2011).

The coastal regions are at the most prone to these threats as they repeatedly experience intense environmental stress with minimal response from the government and the international community. There are several causes of environmental insecurity such as the depletion of the ozone layer, pollution, deforestation, acid rain, erosion, flood, sea level rise, gas flaring, etc.

This study focuses on the recent Niger Delta coastal flood, where no fewer than three million persons were displaced and a few others died. The study and its case scenario are linked to a broader elucidation of Nigeria's commitment to global environmental conventions. This is significant in an era of post Rio +20 world environmental summit of 2012. We argue that climate change vulnerability remains an issue of urgent policy attention among the poor coastal regions.

In this context, we seek to examine the recent environmentally induced travail of the Niger Delta people namely; the October and November 2012 coastal floods. This is important in view of the reoccurring incidence of coastal erosion, acid rains, oil minority politics, ozone layer depletion, oil spill, environmental pollution, sea level rise and ocean surge within the volatile region. The region is a minority area in Nigeria which implies that they are numerically less as compared to the major ethnic groups. This study significantly examines how the federal government is responding to the problems of these groups. This is linked to a brief elucidation of Nigeria's commitment to some global environmental protocols and how these have impacted awareness on climate change vulnerability. The essay argues that policy discourse to improve the lots of the poor coastal regions is important.

MATERIALS AND METHODS

This study provides a case analysis of displacement arising from coastal erosion, the victims and implications for policy discourse. It adopted a participatory methodology through Focused Group Discussions (FGD), Questionnaires and Oral interviews as primary data sources to evaluate the level of environmental damage and security threats arising from the October and November 2012 flood disaster.

Participatory methodology is suitable, being a direct and all inclusive approach, the victims were reached for interviews and on the ground analysis of the problems of the study. According to Chambers (2010), current development thinking and practice have diverged into two clusters, with procedures associated with the paradigm of things imposed by powerful actors and organizations in tension and contradiction with participatory methodologies (PMs) associated with the paradigm of people. PMs that combine methods have proved increasingly versatile and adaptable to contexts and purposes. For our purpose we explore the "paradigm of people".

Secondary data sources included authoritative reports from National Emergency Management Agency (NEMA), UNEP reports, newspapers, magazines, reports and documents published by government and non-governmental organizations. The sampling technique was largely purposive due in part to the sensitivity of the issues investigated.

Two open-ended questionnaires were used to elicit two types of information on climate change vulnerability, displacement and insecurity. The first, the general sample (GS) questionnaire elicited general information about climate change in the Niger Delta and was directed at community members, youths, women and elders. A total of 255 questionnaires were received from those distributed, (80 in Bayelsa, 100 in Delta and 75 in Rivers). The second questionnaire (key informant sample) sought in-depth, broad and sensitive information from more informed citizens of the region such as teachers, civil servants, environmental engineers, literate farmers, etc.

A total of 55 questionnaires were received: 20 in Bayelsa, 20 in Delta and 15 in Rivers State). The overall return rate of distributed instruments for data collection revealed 88% response. Oral interviews were also conducted. The objective was to elicit detailed and informed information from rural women, heads of households, fishermen and farmers who could not write. Beyond the interviews were FGDs, three each were conducted in Bayelsa (Yenagoa), Delta (Asaba) and Rivers (Port Harcourt) with sample sizes of 12, 8 and 8, respectively. The aim was to further retest the earlier data for validity.

Nigeria and commitment to some global environmental summits and protocols

Nigeria is committed to several multilateral environmental agreements (MEAs), summits and protocols. The Stockholm conference of 1972 became a spring board on which subsequent global environmental summits were organized. This include the 1992 Rio earth summit, the UN –Rio +5 by group of experts in 2007, in 2002 the Johannesburg Plan of Implementation and the Rio +20 in 2012.

The international community has negotiated and brought into effect various Multilateral Environmental Agreements (MEAs), including the Rio Conventions: the UNFCCC, UNCCD, CBD developed at the Rio Earth Summit in 1992. These conventions are also related to other MEAs that have been agreed over the years including the CITES and Ramsar Convention on Wetlands. Nigeria is party to all these MEAs listed above. However, like most of the developing world, progress in implementing the obligations of these agreements has been limited, as has been identified in the reports that the country has been submitting to the conferences that these conventions hold regularly.

Ramsar, Convention on Wetlands 1971

The Convention on Wetlands, commonly referred to as the Ramsar Convention was signed in the city of Ramsar, Iran in 1971. The purpose of this convention is to conserve and promote wise use of the wetlands. Furthermore, the convention aims to raise awareness among the nations about the ecosystem services that wetlands provide including biodiversity aspects of habitats to a wide variety of plants and animals (Final Act, 1971).

Kyoto Protocol to the United Nations Framework Convention on Climate Change

The Kyoto Protocol was adopted in Kyoto, Japan, on 11 December 1997 and entered into force on 16 February 2005. The detailed rules for the implementation of the protocol were adopted at COP 7 in Marrakesh, Morocco, in 2001, and are referred to as the "Marrakesh Accords." Its first commitment period started in 2008 and ended in 2012. The objective of the protocol is that each party included in Annex I, in achieving its quantified emission limitation and reduction commitments under Article 3, in order to promote sustainable development, shall:

- (a) Implement and/or further elaborate policies and measures in accordance with its national circumstances, such as:
 - (i) Enhancement of energy efficiency in relevant sectors of the national economy;
 - (ii) Protection and enhancement of sinks and reservoirs of greenhouse gases not controlled by the Montreal Protocol, taking into account its commitments under relevant international environmental agreements; promotion of sustainable forest management practices, afforestation and reforestation;
 - (iii) Promotion of sustainable forms of agriculture in light of climate change considerations;
 - (iv) Research on, and promotion, development and increased use of, new and renewable forms of energy, of carbon dioxide sequestration technologies and of advanced and innovative environmentally sound technologies;
 - (v) Progressive reduction or phasing out of market imperfections, fiscal incentives, tax and duty exemptions and subsidies in all greenhouse gas emitting sectors that run counter to the objective of the convention and application of market instruments;
 - (vi) Encouragement of appropriate reforms in relevant sectors aimed at promoting policies and measures which limit or reduce emissions of greenhouse gases not controlled by the Montreal

Protocol;

vii) Measures to limit and/or reduce emissions of greenhouse gases not controlled by the Montreal Protocol in the transport sector;

(viii) Limitation and/or reduction of methane emissions through recovery and use in waste management, as well as in the production, transport and distribution of energy (Kyoto Protocol, 1998).

(b) Cooperate with other such parties to enhance the individual and combined effectiveness of their policies and measures adopted under this Article, pursuant to Article 4, paragraph 2 (e) (i), of the Convention. To this end, these parties shall take steps to share their experience and exchange information on such policies and measures, including developing ways of improving their comparability, transparency and effectiveness. The Conference of the Parties serving as the meeting of the Parties to this Protocol shall, at its first session or as soon as practicable thereafter, consider ways to facilitate such cooperation, taking into account all relevant information (Kyoto Protocol, 1998).

In Doha, Qatar, on 8 December 2012, the "Doha Amendment to the Kyoto Protocol" was adopted. The amendment includes:

1. New commitments for Annex I Parties to the Kyoto Protocol who agreed to take on commitments in a second commitment period from 1 January 2013 to 31 December 2020;
2. A revised list of greenhouse gases (GHG) to be reported on by Parties in the second commitment period; and
3. Amendments to several articles of the Kyoto Protocol which specifically referenced issues pertaining to the first commitment period and which needed to be updated for the second commitment period.

On 21 December 2012, the amendment was circulated by the Secretary-General of the United Nations, acting in his capacity as Depositary, to all Parties to the Kyoto Protocol in accordance with Articles 20 and 21 of the Protocol.

During the first commitment period, 37 industrialized countries and the European Community was committed to reduce GHG emissions to an average of five percent against 1990 levels. During the second commitment period, Parties committed to reduce GHG emissions by at least 18% below 1990 levels in the eight-year period from 2013 to 2020; however, the composition of Parties in the second commitment period is different from the first (Doha Amendment Report, 2012).

United Nations Convention on Biological Diversity 1992

The main objectives of this convention as indicated in Article 1, are the conservation of biological diversity, the sustainable use of its components and the fair and equitable sharing of benefits arising out of the utilization of genetic resources, including by appropriate access to genetic resources and by appropriate transfer of relevant technologies, taking into account all rights over those resources and to technologies, and by appropriate funding (UN, 1992).

United Nations Framework Convention on Climate Change 1999

The objective of the Convention on Climate Change is to achieve, in accordance with the relevant provisions of the convention, stabilization of greenhouse gas concentrations in the atmosphere at the level that would prevent dangerous anthropogenic interference with the climate system. Such a level should be achieved within a timeframe sufficient to allow ecosystems to adapt naturally to climate change, to ensure that food production is not threatened and to enable economic development to proceed in a sustainable manner (UNFCCC, 1999).

Within African sub region, there are regional environmental summits. The first ever regional comprehensive report on the state of Africa's environment-*Africa Environment Outlook* (AEO), which

was specifically requested by African Ministerial Conference on Environment (AMCEN), in collaboration with United Nations Environmental Programme (UNEP), reinforces environmental breakdown as it traces environment and development trends since the 1972 United Nations Conference on the Human Environment and provided a comprehensive analysis of status and trends of the environment in Africa which has been abysmal.

Also, the First Africa Drylands Week and World Day to Combat Desertification which recently held in Dakar, Senegal, from June 10-17, 2011 was aimed to Combat desertification. Overall deforestation has declined globally, but persists in Africa and South America, according to the FAO's 2010 Global Forests Resource Assessment. The pressure on arid zone forests and the rangelands that protect them may increase, especially in the tropical and sub-tropical regions, from two opposing forces, according to the assessment (Wolf, 2011).

RESULTS AND DISCUSSION

Dynamics of the October and November 2012 flooding

The data collated from the study including Focused Group Discussions (FGD) questionnaires and oral interviews provided objective significant relationship between flooding, environmental security and displacement.

Similarly, a recent empirical study in this direction equally corroborates this result (Amadi, 2013). On October 7, 2012 a flood disaster affected communities lying on the path of the River Niger and River Benue, this included the people of the Niger Delta area as the River Niger overflowed and had disruptive effects on lives and properties (Figure 1). Data collated from the study revealed 95% damage on farms lands and animals, while several houses submerged and many people were rendered homeless especially in the Delta and Edo states axis. This phenomenal occurrence was historic and significant to the growing discourse on vulnerability of climate change as corroborated in a similar study (Amadi, 2013; NEMA, 2012).

In Rivers State, a subsequent occurrence was witnessed the Orashi river a tributary of river Niger overflowed on November 3, 2012. Our data confirmed that "about three persons: an infant and two women died", several others displaced, as "no fewer than 24 communities and several houses were submerged" (Agbu, 2012). Most affected included Udoda, Igovia, Kunsha, Ikodi Town, Mbiama, Akinima, Okolobiamia, Okparaki, Okarki town, Akiogbologbo, Agbo, Ishiaye, Akioiso, Isusu, Isua, Odqwa, Edagberi and Betterland as well as Oshiebele, Oshi, Odieroke-Ubie, Enito, Akara-mini, all in Ahoada-West local government area of the state.

One of the displaced flood victims in Omoku, the headquarters of Ogba/Egbema Local Government Area of Rivers State, Mr. Ikediukwu Adiele, lamented that people in his village lost many property and many of them are now homeless. "For three days now, we have been wading through the water to pick some valuable items from our flooded homes. As you can see, we are now using canoe to move around (Agbu, 2012). Several



Figure 1. Map of Niger Delta showing the major cities in the region. Source: National Bureau on Statistics.

dimensions of hazards and challenges were experienced by the affected communities.

“Also, areas badly hit by the disaster included, Okwuzi, Ase-Azaga, Isukwa, Odugiri, Agwe, Onikwu, Ugbaja, Isala, Ogbе-Ogene, Utu, Adiawai, Obiofu, Kreigani, Obrikom, Idu and Ebocha as well as Umu-Onyema quarters in Ndoni, all in Ogbа/Egbema/Ndoni local government area of the state. Unfortunately, the Rivers State government, the authorities of two affected local government councils as well as the National Emergency Management Agency (NEMA) was not in the know of the flooding in the communities until the Senate Committee on Environment and Ecology raised the alarm” (Daily News, 2012).

While families parked out of the affected communities in the area, farmers in the area began early harvesting of their root crops, especially cassava and yam so as to avoid losing them to the flood. (Amdi, 2013). An indigene of Edageberi community, Bonny Otiatie Ulolo, said although, people of the area usually experience minor flooding every November as a result of over-flow of the Orashi River, the present situation was unprecedented in the history of the communities (Leadership Newspaper, 2012).

According to some victims, “the intensity of the disaster has never been experienced in recent times in the area as floods usually come and go but this persisted magnificently” (Leadership Newspaper, 2012).

The Rivers State Commissioner for Special Duties, Chief Emeka Nwogu, in company of the chairman of the council, Hon. Raymond Nwokeocha has visited the

affected communities to ascertain the level of damage. Nwogu, who was deeply touched by the plight of the victims, expressed sympathy over the incident, describing it as a great loss to the state and appealed to those that are yet to evacuate to do so to avoid more loss of lives (Leadership Newspaper, 2012).

Indigenes of the affected communities blamed the cause of flood on the over flow of the River Niger, explaining that the last time they experienced such flooding was in 1994 and 1998 respectively and described this year’s disaster as exceptional (Leadership Newspaper, 2012).

To Emenike Umesi, the South-South co-ordinator of NEMA, the agency had been aware of the flood situation in the affected communities in Ahoda-West and Ogbа/Egbema/Ndoni Local Government Area of the state and had been working on the affected areas. He said they had concluded assessment of the affected communities to determine the level of assistance that could be given to the victims, adding that the agency identified a camp for victims but it was swept off by flood (Leadership Newspaper, 2012).

In Delta State, communities have been sacked, farmland destroyed from Asaba, the Delta State capital to Oko, down to Utchi to Aboh, Abari and Bomadi, residents were displaced even as over 1,000 houses are believed to have collapsed. “We thought it will not come to some of us who were some distances away from the river. “We kept vigil all night and it was when the tide increased that we decided to move our things upland in the open.

“It is amazing to us that the water is increasing this time

of the year”, Mr. Ifeanyi Okafor, a tenant at OgbeOfu/Jarret area of Asaba, said (Leadership Newspaper, 2012). “Areas that were spared at the initial time, have now been submerged. For instance, the former secretary to the then Bendel State government and Iyase of Asaba, Chief Patrick Onyeobi was hit severely as his palace compound and others were submerged. Before now, the shoreline around his house by the River Niger was very secured and no one ever thought the vexatious Niger could have been so offended to rise to such a level as to sack the former SSG and many others in Delta Capital” (The Tribune, 2012).

One of the earlier sufferers of the flood in Asaba was the Nigeria Immigration service office and the tourist Ganda hotel by the bridge head. The riverine people braved the odds, paddling canoes to their homes, retrieved their property and ferrying them to the highways which have become home for them (The Tribune, 2012). The Asaba experience speaks for several communities now devastated by the ravaging flood especially in Aniocha North, Ndokwa land, Isoko, Patani, Bomadi and Burutu communities amongst others. The case of Ewulu community in Aniocha South Council is Pathetic in the sense that over 100 houses, were pulled down, and both elderly and the sick ones trapped as water from River Umuoni, a tributary of the Niger overflowed its bank, The Ase River, which traversed the Ndokwa nation was also a channel through which the rising Niger flood unleashed more troubles on inhabitants (The Tribune, 2012).

Scores of displaced farmers in Ndokwa East of Delta are now seeking refuge on the upland of Ashaka and Utagba-Ogbe, Kwale towns following the washing away of their communities, farmland and crops by flood from the River Niger and its tributary, Ase Creek (The Tribune, 2012).

A visit to the area revealed that the water rose in fury and submerged farmlands and crops on the alluvial rich islands and adjoining farms on both sides of the River Niger thereby sacking the farmers and destroying their fish ponds, homes and markets. “We have never had it this bad in a life time, government and its agencies should come to our rescue” (The Tribune, 2012). Communities most affected along the River Niger are, Aballa-Oshimili, Utchi Communities of Okwumedo, Umuochi, Owelle, Obalu and Obeche, Okpai, Abalagada, Aboh, Abuato, Ugbene, Agwe-Iyom, Ise-Onokpo, Onuobiuku, Umu-Ugbome, Umu-Uti, Afiankwo, Umuolu, Adiai, Utuoku, Oworubia, Wari-Irri, and Onyah. Other communities affected included Aballa-Obodo, Aballa-Uno, Inyi communities of (Umu-Inyagbo, Obeche, Umu-Agwuyam, Isiolu, Umuoga, Ezinyi, Utuke, Ude, Oigigogwe, Ezeagba), Umu-Eche, Ogwasi, Umugwo, Umuazu, Ozala, all in Onuaboh. The flood also ravaged Akarai, Azagba, Ekpe, Ibedeni, Osafu, Ase, Asaba-Ase, Onogbokor, Iyede-Ame and Anyama (Kiagbodo, 2012). “Chief Nnamdi Olise-Atuoku and Mr. Raphael Nwammana who are now seeking refuge at Ashaka and

Kwale respectively said that yam, cassava, plantain, vegetables, garden eggs and pepper among others were completely destroyed in their farms” (The Tribune, 2012).

Camps were opened in Asaba, Tuomo in Burutu Bomadi, Okwagbe in Ughelli South, Patani and Aboh among other places to take in the displaced persons. On a daily basis, the camps received more victims, even in Asaba, another camp was opened at I.C.E to take in people from Utchi and Oko communities to compliment the St Patrick College camps for hundreds of displaced persons in Asaba (The Tribune, 2012).

According to the Delta State Governor, Emmanuel Uduaghan, “After the aerial overview, I started the ground assessment by vehicle and boat. The situation is pathetic. My first encounter with the victims was at Oko communities in Oshimili South Local Government Area of the state. The three communities of Oko Amakom, Oko Ogbele and Oko Anala were flooded and the villagers gathered as refugees by the roadside. I had to talk to them that we will open camps to offer them temporary accommodation from the rage of nature, but some of them were reluctant to come to the camp, one of which was already opened at Saint Patrick’s College, Asaba” (The Tribune, 2012).

“The displaced persons occupied half of the Benin-Asaba-Onitsha expressway and it was obvious that there would not be movement from either Asaba to Onitsha or vice versa if the situation was not taken care of” (The Tribune, 2012).

According to a rural farmer, “our farms are badly damaged we are faced with dual challenges of hunger and housing” (Ifejika, 2012).

The situation in Oguta was no less distressing several victims of the flood in Oguta and Ohaji/Egbema Local Government Areas of Imo State were equally lamenting. About eight communities were affected in Egbema. According to the director of administration of the Ohaji/Egbema LGA, Barrister Alloy Obinna, “eight communities were affected in the Egbema area alone. Our fish ponds, farm lands, plantain, cassava, economic trees and crops are now under water. Over 123 farm settlements and satellite towns are under water and about 8,000 persons have no homes now”, he said (The Vanguard, 2012).

In Edo State, the Edo State Deputy Governor, Dr. Pius Odubure counted the intensity of the disaster in the communities in the area (Daily News, 2012).

In Cross-River State, Mr Fabian Okpa, the Special Adviser to Gov. Liyel Imoke on Special Duties, recounted that, “ nine of the 18 local government areas of the state were affected” (Daily News, 2012).

‘In an interview, Obi Emmanuel Obiechina, a leader of the Aika community in Ndokwa East local government area, said his residence was submerged by the flood. In addition, he stated that the lives of members of his community were shattered, with most of them refugees in various communities in Delta and Anambra States. Mr. Obiechina had taken refuge in a hotel in Asaba’ (Daily

News, 2012). 'The traditional ruler said that he refused to send his people to camps for displaced people set up by the state government because those in the camps were being dehumanized. He blamed the excessive flooding on dereliction of duty by the government'. "We have lived in that community for more than 500 years and we have not had this kind of disaster before. It's the opening of the dams that have now brought this flooding on us. We are so devastated and everything that the Aika people have—land, crops, houses have been washed away" (Daily News, 2012).

Till date, rehabilitating the impacted areas have been a challenge. Awosika et al. (1992) study foreshadowed this concern as they observed that, "In Nigeria, a potentially massive "environmental refugee" migration will occur. For a 1-m rise, more than 3 million people are at risk, based on the present population. The estimated number of people that would be displaced ranges from 740,000 for a 0.2m rise to 3.7 million for a 1m rise and 10 million for a 2m rise".

Also, the presence of crude oil and its exploitation means further environmental degradation and hazards for the region. These are threats to environmental sustainability.

Experts have noted that, riverine flooding, is often a function of precipitation and water runoff volumes within the watershed of the stream or river; also there is the Coastal flooding, which is typically a result of storm surge, wind-drive waves, and heavy rainfall (Awosika et al., 1992). They contend that storm surges may overrun barrier islands and push seawater up coastal rivers and inlets, blocking the downstream flow of inland runoff. Also, there is the Urban flooding, which occurs where there has been development within stream flood plains, these are indicators that the Niger Delta region like most African coastal areas are volatile and prone to environmental hazards.

The growing discussion is that several coastal communities are prone to dangers of climate change vulnerabilities in several disruptive manners.

Challenges and effects of the flooding

There are divergent challenges of the effects including peasant food production decline in the region (Amadi, 2013), hunger, displacement and migration.

The United Nations says Nigeria will need \$38 million (about N5.7 billion) in emergency aid to help 2.1 million people uprooted from their homes by flooding (Channels Report, 2012). According to Jens Laerke the spokesperson for the UN's Office for the Coordination of Humanitarian Affairs, explaining the aid plan said, "the plan includes help with food, water, shelter and schools mainly in farming and fishing communities along the Niger River" (Channels Report, 2012).

There are several dimensions to the effects of the flood disaster. A close observer on the Delta State incident

recounts: At least five people, including two children and a traditional ruler, have died as a result of continued massive flooding that has ravaged parts of Delta State in Nigeria's oil-rich Niger Delta. In addition, the floods have submerged a multi-billion naira Okpai Independent Power Plant (IPP). Large parts of Ndokwa East local government area are also under water". The still rising flood has affected parts of Asaba, the state capital, as well as such communities as Ovrode, Ofagbe, Okpe-Isoko, Lagos Iyede, Igeh, IkpideIrri, Ivrogno, Onogboko, Itebioge, Iyede-Ame and Azagba. Other flooded areas include Otoka-Ekegbresi, Egbeme, Okrama-Oyede, Warri, Iwrie Ogbokor, Ekpe, Asafo, Umeh, Aviara, Uzere, Asaba-Ase, Aboh, Kwale and Ashaka. Isoko South and North and Ndokwa East local government areas are the most devastated. In Aboh community, the flooding led to the death of a local monarch and two children. Three other persons reportedly lost their lives at the relief camp in Ivrogbo, Isoko South council area. Survivors of the flood were then relocated to St. Michael's College in Oleh, the headquarters of the local government area. The flood wreaked havoc on farms, schools, courts, health centers, markets and electricity installations. People now use canoes as the only means of getting about in the flooded communities (Sahara Reporters, 2012).

According to the National Secretary of the Ijaw National Congress, Mr. Robinson Esite, "some of the residents of Patani who struggled to get some valuables from the flooded community were just standing by the road side not knowing what to do. He said, "I can tell you that there is a serious humanitarian crisis in this part of the Niger Delta now. The town of Patani, Adagbabiri and Bomadi have been sacked by flood. "In Patani, the flood is such that no building is spared and the people of Patani are in a terrible state. Many of them are just standing by the road side with the few properties they were able to rescue from the flood (Sahara Reporters, 2012).

Also, a Niger Delta activist from the town Mr. Presidor Ghomorai, said, "Patani is gone, it is a hopeless situation, only the youths are left there. And as it is, the flood is threatening Bomadi seriously" (Sahara Reporters, 2012).

"In Bayelsa, for instance, much of government business has been limited to managing the flood fall-outs. Even the Creek Haven, Yenagoa, the seat of the state government is not on safe grounds. The state has been marooned by flowing water for close to a month now into an island" (Sahara Reporters, 2012).

In Yenagoa (capital of Bayelsa State) where the ex-militants were undergoing a rehabilitation training, the spokesperson for the presidential aid on amnesty, expressed concern over the magnitude of destruction inflicted on Niger Delta by the recent flood, saying; "the greatest challenge facing the region would be how to manage the disaster caused by the deluge". Coordinator of the Presidential Amnesty Programme and Special Adviser to the President on Niger Delta Affairs, Mr. Kingsley Kuku, in Yenagoa while presenting three truckloads of

relief materials to the state government for victims of the flood, said the aftermath of the disaster would be more challenging than the disaster itself. Represented by Mr. Tawari Dortimi, Kuku called on all the affected states to map out strategies to contend with the challenges ahead (In NEWS, 2012). The ex-militants undergoing rehabilitation donated some money from their allowances to alleviate the sufferings in the affected areas.

In his remarks, the Deputy Governor, Rear Admiral John Jonah (rtd), said the government had held series of meetings to develop post disaster management, saying that government was also worried about transporting relief materials to displaced persons in remote areas. "Our post flood management strategies will include policies in agriculture. We are thinking of how to get our food back to avoid food shortage. We are brainstorming to know how to reduce the pains", he said (In NEWS, 2012).

Other areas affected included the Niger Delta University at the Wilberforce Island in Amassoma. The flood destroyed several offices, lecture halls, hostels, students properties including credentials, textbooks/materials, vehicles, farmlands, etc. In a statement by the Registrar of the institution Mr. Tonbra Morris-Odubo a notice of indefinite suspension of resumption date for the 2012/2013 academic session' supposedly fixed for 8th October 2012 was made (In NEWS, 2012). There was fear of outbreak of epidemic in the flood-ravaged Obuwari settlement, equally referred to as Mile I, in Sagbama, headquarters of Sagbama Local Government Area in Bayelsa. About 300 buildings, including public and private schools in the area, were submerged.

Equally affected are those living along the Rivers Niger and Benue and with the volume of water from the two biggest rivers confluencing in Lokoja, Kogi State, if the water rose above sea level toward the south down to the creek mostly of Delta and Bayelsa State. Communities on both sides of the river Niger as well as those along the distributional became victims (In NEWS, 2012).

In Rivers State, the impact is mainly in the areas traversed by the Orashi and Sombreiro Rivers in the west senatorial district. Specifically, Ahoada West and East, Ogba/Egbema/Ndoni and Abua/Odua councils were in the bull's eye. From Akabuka and westward through Oboburu, Obagi, Edu, Obigbo and Etu, down to Ohali, the road had become part of the Orashi River. Eastward to Erema, Ibewa and Ituli, there is respite, thereby forcing a drift in that direct from the western end. Both sides, demographically, constitute Egi clan, which is part of Ogba Kingdom, where about 90% of the upstream operations of French oil giant, Total, is concentrated (The Guardian, 2012).

Chibuzor Ugwoha, the immediate past managing director of the Niger Delta Development Commission (NDDC), whose father's house in Erema has since been taken over by distant relations and even unknown persons sacked by the flood in the west end of the Egi

kingdom, said: "I have never seen a thing like this since I was born. In situations like this, you do not ask questions or even probe the clans and identities of persons flooding in. The first and most logical thing to do is to let them in and then do whatever is possible to offer them immediate hope" (The Guardian, 2012).

Several heart-ripping stories came from the impacted communities several animals including pythons, antelopes and grasscutters were seen floating" (Wokocha, 2012). Ojumite, who claimed he had remained separated from his children and wife since the flood began, explained: "Our people are not conversant with canoes; we cannot swim, we conduct all our businesses on land and so what we are currently witnessing is like asking us to adopt new ways of life after centuries of existence" (The Guardian, 2012). That helplessness was most tragically expressed in the event involving one Odoka Benson from Obagi a rural community in Rivers State. He had returned to Obagi from Omoku, where he was taking refuge. At sunset, he was ready to go. As if actually bent on departing finally, he turned down entreaties to stay the night anyhow in the flooded town, because it had become late and the boat operators had closed business for the day (The Guardian, 2012). He reportedly got to the anchorage, forced out a boat and boarded, in company of his pregnant wife and daughter of one Pastor Blessing Dikogwo, their two children, a lady and himself (The Guardian, 2012). Apparently, Benson might have reasoned that the business of moving canoes on water was all mechanical without any form of mental calculations. But midway or midstream, because the Akabuka-Obagi road had also become a stream, 'the captain' got what he did not bargain for. He was up against the forceful tide of the water flowing across the road (Sahara Reporters, 2012).

It became an ill-fated voyage, as everyone on board, except himself, was swept away by the tide. The lady on board was the elder sister of Wisdom Nwoko-Omere, who is among persons awarded scholarship by the NDDC to pursue post-graduate studies in universities abroad (Sahara Reporters, 2012).

'One Azubike Nwaoga returned from Babcock University in Ogun State, where he is studying hard to become a better priest of the Seventh Day Adventist Church, to begin from the scratch'. 'The flood overwhelmed his home while away in school and the folks he left behind reported that all his belongings went with the water, except his motor-bike. He took solace in the Bible: "In all things, we give thanks to God" (Sahara Reporters, 2012). Ojumite could not do much when his house was overrun in Ahoada. "The only thing I could take out of my house is my certificate," he bemoaned. His ponds were flooded and the fishes in them spilled into the wild.' The collective loss is equally enormous (Sahara Reporters, 2012).

'Many of the social facilities provided by Total as part of its Corporate Social Responsibility (CSR) to its host

communities are endangered. For instance, the health centre in Ogborgu stood submerged as at last week. The water scheme at Akabuka was itself under water and it was not likely it was still giving good water to the community' (Sahara Reporters, 2012).

'The grand benefactor itself, Total, is battling for a life-line. It has been forced to temporarily closed shop in Ogba Kingdom. Its External Communications manager, Charles Ebereonwu, neither confirmed nor denied outrightly the claim that the oil company had shut down operations. He only said: "We are talking about lives here and I think life is more important than production" (Sahara Reporters, 2012).

'In real terms, this means that about 40,000 barrels of crude, representing Total's contribution, have been cut back from the 2.6 million barrels per day (bpd) national output. One environmentalist in Port Harcourt added a frightening dimension'. He said: "Total's waste pits and other disposal sites have been flooded. Chemicals and other harmful substances that the company uses in its operations have all been washed into flooded homes and farmlands. "We cannot measure the extent of impact until a proper assessment is conducted" (Sahara Reporters, 2012).

'Reacting, Ebereonwu sounded more like a lawyer in court, saying whoever that was asserting should offer proofs'. He said: "This is a nationwide tragedy, not restricted to Total, and so whoever that is alleging pollution should provide the evidence" (Sahara Reporters, 2012).

'All the same, the company has been part of the coordinated efforts by the Rivers State government at rehabilitating the victims, donating materials to the various relief camps in the area. Unlike fire, water can hardly be contained. It dissipates on its own and it is not different in the current situation' (Sahara Reporters, 2012).

With several persons displaced and living in temporary camps, their daily subsistence has been a challenge. An observer on the allocation of the relief materials provided by the Niger Delta Development Commission (NDDC) said, "We are not satisfied based on what the masses are facing in the hands of those feeding us. They are mismanaging the relief materials that are given to them; even though government supply those things in quantity; they economise them," one of the victims complained. The representative of the Agency, Prof. Aminigo advised the people to always cooperate with those managing affairs in the camps, noting that the materials donated by the agency would go a long way to ameliorate their plight. The materials were provided in most affected communities in the various Niger Delta states' (Sahara Reporters, 2012).

"Flooding in the oil rich Niger Delta, has disrupted oil production to the tune of around 500,000 barrels per day (bpd)— more than a fifth of nation's oil output according to the Department of Petroleum Resources" (Sahara Reporters, 2012).

Managing the issue has been a complicated affair for both the victims and the governments of the region. Most of the camps established for the Internally Displaced Persons (IDPs), could hardly contain them, others are not in good habitable conditions. The temporary camp has been described as worse and could lead to outbreak of diseases as most of them are over-stretched.

Recommendations: Mitigation strategies

Climate change has been an issue of global concern. Flood control in the region needs collaborative efforts including the cooperation of government, policy makers, international and local communities, enlightenment programmes and capacity building through environmental education involving NGOs, CBOs and the mass media, could reassert the level of awareness of the poor inhabitants of the coastal regions to understand the enormity of the challenges posed by climate change.

Gender and environmental security should be given novel policy priority especially among the volatile and poor coastal regions. According to the Rio 2012 report, "the implementation of sustainable development will depend on the active engagement of both the public and the private sectors. We recognize that the active participation of the private sector can contribute to the achievement of sustainable development, including through the important tool of public-private partnerships. We support national regulatory and policy frameworks that enable business and industry to advance sustainable development initiatives, taking into account the importance of corporate social responsibility. We call on the private sector to engage in responsible business practices, such as those promoted by the United Nations Global Compact" (Rio, 2012).

Importantly, key mitigation strategies could involve mainstreaming climate change adaptation into development planning at all levels of government including local, state and federal. Novel environmental policies should as a matter of expediency evolve participatory strategies to interface with the rural populace on climate change issues such as Rural Climate Change Monitoring Forum (RCCMF). This could be linked directly to State Emergency Management Agency as focal points to relate climate change issues in the rural areas.

Adaptation to climate change and concomitant adverse effects will involve an understanding of climate change parameters and dynamics, including monitoring and data analysis of climate change parameters. This strategy should lead to an African Climate Change Scenario (ACCS), upon which countries can base their adaptation options. Existing scenarios and adaptation measures for climate change and sea-level rise are built around Western experiences (IPCC, 2007).

Within an integrated approach, there is a great opportunity to anticipate problems associated with sea-

level rise rather than simply reaction to change as, or after, it occurs (Nicholls and Leatherman, 1994).

Furthermore, a well-planned response that seeks to anticipate the physical impacts of sea-level rise in a timely fashion will minimize unwise decisions and result in lower costs for reactive responses such as protection (Nicholls and Leatherman, 1995). Anticipatory responses include urban growth planning, building setbacks, wetland preservation and mitigation, public awareness, and integrated coastal zone management (IPCC, 2007).

Policies and regulations concerning the use of the coastal zone for any form of human activity should include consideration of sea-level rise. Physical planning and building-control measures and regulations should be instituted and implemented. Allocation of land for any economically useful purpose in areas likely to be flooded or inundated should be avoided. The public should be informed of the risk of living in coastal and lowland areas that are threatened by sea-level rise. Timely public education on erosion, sea-level rise, and flooding risks could be a cost-effective means of reducing future expenditures. Where coastal infrastructures such as roads, fish land, and curing plants are approved and must be constructed, the authorities and owners of these infrastructures should make sure that marginal increases in the height of the structures are included to offset sea-level rise (Smith and Lenhart, 1996) and other related phenomena. People located in high-risk areas should be offered incentives to relocate out of these areas. Setbacks could be used as buffer zones to allow sea level to rise without threatening coastal development. French et al. (1995) recommended incorporating buffer zones between the shore and new coastal development in Nigeria (IPCC, 2007).

There is urgent need of bringing all actors in the coastal areas together to address coastal-zone problems. The program should consist of a set of principles and plans to guide the use of coastal land and resources for conservation, recreation and sustainable.

Environmental activism and awareness will ameliorate unsustainable environmental consumption by all stakeholders including the MNCs operating in the region.

Conclusion

Climate change and global warming are now scientifically established facts. Climate change is a massive threat to human development and in some places it is already undermining the achievement of the Millennium Development Goals (MDGs) and the international community's efforts to reduce extreme poverty. The issue of climate change is global. Nigeria and indeed Africa is not excluded from its threats.

Our study had the aim of understanding environmental security in the coastal regions of Nigeria; how disasters such as flooding and its effects have impacted the region, the level of response by the state and the international

community. The results derived from this study show that majority of the people in the area have little knowledge of climate change vulnerability, frequency in occurrence of the incident and the causes. Again, most flood victims do not get compensation or relief during flood disaster, majority of those we interviewed who are artisans and peasants, with occupation such as fishing, subsistence agriculture, expressed dissatisfaction with the level of response by the government and policy makers to their plights.

Climate change will exacerbate existing physical, ecological/biological and socioeconomic stresses on the African coastal zone. Most existing studies focus on the extent to which rising sea level could inundate and erode low-lying areas or increase flooding caused by storm surges and intense rainstorms. The coastal nations of west and central Africa (Senegal, The Gambia, Sierra Leone, Nigeria, Cameroon, Gabon, Angola) have low-lying lagoonal coasts that are susceptible to erosion and hence are threatened by sea-level rise, particularly because most of the countries in this area have major and rapidly expanding cities on the coast (IPCC, 2007).

Africa's west coast often is buffeted by storm surges and currently is at risk of erosion, inundation, and extreme storm events. Inundation could be a significant concern (Awosika et al., 1992; Dennis et al., 1995; French et al., 1995; ICST, 1996; Jallow et al., 1996; IPCC, 2007). Major cities such as Banjul (Jallow et al., 1996), Abidjan, Tabaou, Grand Bassam, Sassandra, San Pedro (ICST, 1996), Lagos and Port Harcourt (Awosika et al., 1992)- all situated at sea level would be very vulnerable. Finally, tidal waves, storm surges, and hazards also may increase and may modify littoral transport (Allersman and Tilsman, 1993 cited in IPCC, 2007).

Carbon dioxide emissions in the area are among the highest in the world. Some 45.8 billion kilowatts of heat are discharged into the atmosphere of the Niger Delta from flaring 1.8 billion cubic feet of gas every day. It has been reported that gas flaring has raised temperatures of the region and rendered many areas uninhabitable.

This study attempted to examine the scenarios of the climate change in the Niger Delta region, its vulnerability and impacts and provided possible mitigations to stem the tide of global warming and environmental degradation in the region.

Finally, the study concludes that climate change is largely though not exclusive attribute of anthropogenic activities of man and could be checked only if these activities are reduced.

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