

**TOWARDS ENHANCING THE ADAPTIVE CAPACITY OF NIGERIA:
A REVIEW OF THE COUNTRY'S STATE OF PREPAREDNESS
FOR CLIMATE CHANGE ADAPATATION**

REPORT SUBMITTED

BY

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TABLE OF CONTENT

Executive Summary	3
1. Introduction	5
2. Nigeria’s vulnerability to climate change	6
3. Climate capacity development framework	13
4. Study methodology	15
5. Major findings	15
5.1 Constitutional and legislative framework	15
5.2 Climate change adaptation relevant policies, strategies and plans	18
5.3 Structural determinants of Nigeria’s climate change adaptation capacities	27
5.4 Climate actors	30
6. Case study of Ghana – policy/strategic approach	35
6.1 Policy	35
6.2 Political	36
6.3 Climate actors	37
6.4 Comparative assessment	37
7. Enhancing Nigeria’s capacity for climate change adaptation	38
7.1 The issues in Nigeria-Ghana context	38
7.2 Possible areas for HBS intervention	40
8. Conclusion	43
Bibliography	44
Annex I Terms of Reference for the Assignment	45
Annex II Questionnaire	48
Annex III Profile of some NGO climate actors in Nigeria	51
Annex IV Profile of some international bilateral and research institutions and NGO climate actors in Nigeria	55

EXECUTIVE SUMMARY

Climate change is a major threat to the sustainable development of Nigeria. Responding to climate change from both mitigation and adaptation angles require strategic approaches from policy, regulatory and institutional frameworks and capacities. In this scoping study, we examined the extent to which the adaptive capacities of Nigeria have been utilized to influence sectoral policies that have influence in enhancing the national climate change adaptation response. We also examined the strength of the few climate change institutions and agencies in Nigeria and the level of their preparedness to put Nigeria in the position of adequate response to climate change. Other criteria used to evaluate Nigeria's adaptation capacities include (i) the involvement of the political class in climate change issues, (ii) level of public awareness, and (iii) the level of participation of different climate actors, including government and non-governmental organizations, private sector operator and development partners. We made a short comparative analysis of the Nigerian situation with the situation in Ghana based on the available public information on the latter country.

In general, Nigeria has many policies, strategies and plans that can address general adaptation measures in some climate change vulnerable sectors such as agriculture, water resources, forests and ecosystems, and coastal marine environment. However, the policy framework to align human development and climate change response efforts through adaptation is largely undeveloped in the country. The country's institutional capacity to respond effectively to climate change is weak. Apart from the SCCU in the Federal Ministry of Environment and a few institutions at the national level (e.g. NIMET and the Climate Centre in Minna), there is no formal institutional structure at state and local government levels to address climate change. Even then, the capacity of SCCU to drive and coordinate national climate change response is weak. There are very few people with proven competencies in the Unit and facilities remain inadequate. Furthermore, the national institutions, including the SCCU, are not properly funded.

Unlike Ghana, Nigeria has not been able to develop a structured approach to climate change adaptation. Ghana was able to do this through the implementation of Netherlands assisted Climate Adaptation Programme (NCAP) that enabled the country to undertake detailed vulnerability assessment of various sectors. The implementation of NCAP has also enabled Ghana to develop a National Climate Change Adaptation Strategy. Nigeria has no *National Climate Change Policy and Strategy* that should have presented Nigeria's current and future efforts to address climate change vulnerability and adaptation. The First National Communication was produced November, 2003. A stakeholders' initiation workshop on the second National Communication (SNC) took place in December 2006, but it is yet to be finalized, and may not be so until sometime later in 2010.

The closest Nigeria is to having an acceptable adaptation response framework is a working document on *Adaptation Strategies of Action* prepared by HBS for the Special Climate Change Unit (SCCU) of the Federal Ministry of Environment, the Nationally Designated Authority for climate change in Nigeria. But there is no clear indication that the document has been adapted as a national plan of action.

There are many climate actors in the country, but there is no platform or framework within which they can operate in a coordinated manner for meaningful impact. A number of ongoing initiatives by different actors remain largely un-coordinated by the nationally designated climate change authority.

Nigeria must address a number of capacity limitations that have been pointed out in this report. Significant effort needs to be made to develop further capacities designed to strengthen Nigeria's climate change adaptation governance. The Heinrich Boll Stiftung (HBS) is a valuable international partner that can help Nigeria to build capacity in relevant government agencies at all levels (national, state, local) to strengthen the country's capacity to develop and implement adaptation response strategies and plans that would her reduce her vulnerability to the impacts of climate change. In this regard, HBS may consider supporting Nigeria to:

1. Undertake a detailed and methodology-proven sectoral analysis (e.g. coastal and marine environment, agriculture, water resources, land management, human health, gender etc.) of Nigeria's vulnerability to climate change and propose realistic adaptation response strategies and initiatives (programmes and projects at all levels, including community-based activities).
2. Enhance its institutional response capacity by providing support to the development and implementation of a capacity building project or initiative for a coordinated institutional response to climate change that will have functional structures at the national, state and local government level, using exiting relevant institutions and agencies (i.e. develop and implement a capacity building initiative for the SCCU or the proposed Climate Change Commission to function in a similar manner to NACA).
3. Successfully mainstream or integrate climate change adaptation into the Vision 2020 and other National Development planning documents.
4. Increase awareness and capacity among Nigerian politicians, policymakers and other key stakeholders to address climate change adaptation within Nigeria's development process.

HBS may need to partner with other bilateral and multilateral development agencies and organizations in this task in order to have meaningful impact in the country.

1. Introduction

Climate change has become the primary environmental threat of the 21st century. It is now on the global political agenda as never before. The efforts to reach a common global approach to tackling climate change culminated in the December 2009 Copenhagen Conference and the formulation of a global legally non-binding Climate Change Accord (Copenhagen Accord). The current concern is based on a number of recent scientific analyses that suggest that potential climate change effects are at a scale that adds urgency not only to the efforts to prevent additional change, but equally important, to efforts to adapt to the impacts already occurring.

Science suggests that its effects are at a scale that adds urgency not only to the efforts to prevent additional change, but equally important, to efforts to adapt to the impacts already occurring. Scientific analyses tend to a general consensus that the Earth is presently tracking towards worst-case impact scenarios outlined in the Fourth Assessment Report of the Inter-Governmental Panel on Climate Change (IPCC), which presented the state of the art on the science of climate change and provided new insights on the wide range of adaptive responses available to respond to climate change from technological, through behavioral, to managerial, and to policy responses. Worse still is the growing evidence (despite recent concerns about climate model outputs) to suggest that these scenarios may be overly conservative. Thus, there is the feeling that if present greenhouse gas emission trends continue we could experience mean sea-level increases of 1m or more. In that regard, we appear to be locked into some degree of climate change regardless what the world does now.

Responding to climate change falls into two broad classes of action, mitigation and adaptation. Mitigation of human-induced climate change refers to measures that may either reduce the increase in greenhouse emissions (abatement) or increase terrestrial storage of carbon (sequestration). Although Nigeria, like other developing countries, is not required under the current global climate change negotiations to take on emission reduction commitments, it nevertheless has to adapt to the expected impacts of anticipated climate change. Adaptation refers to all the responses to climate change that may be used to reduce vulnerability.¹

Responding to climate change through adaptation initiatives will require Nigeria to engage in a concerted effort, over the near- and long-term, to seek out opportunities and design actions to reduce the vulnerability of the people to climate change impacts. Nigeria needs to explore a number of opportunities that exist to build a climate-resilient society that is able to withstand or recover quickly from difficult conditions caused by the adverse effects of climate change, including climate-related hazards and disasters by strengthening its coping or adaptive capacity.

Whatever climate change response measures are intended by a nation, there must be adequate capacity to implement them. In this case of Nigeria, adaptation is the focus. Towards supporting Nigeria to enhance her adaptation capacity, Heinrich Böll Stiftung (HBS) has selected the country as one of the countries which adaptation capacities are examined to determine their level

¹ Vulnerability is susceptibility to harm or damage potential. It considers such factors as the ability of a system to cope or absorb stress or impacts and to “bounce back” or recover

of preparedness to respond to climate change through effective adaptation measures. The terms of reference for the study are given in Annex I.

In this short scoping study, we examine the adaptive capacities that are in place in Nigeria to enable the country to cope with climate change impacts that will make its populace to be more resilient and less vulnerable. We focus on determining whether existing instruments for climate change policy coordination are adequate enough to ensure effective mainstreaming of adaptation objectives into the national development discourse, process, programmes and projects. In particular, we analyzed climate-related policies in the country, and assessed their relevance to enabling the adaptive capacity of the country. Next we discuss the country's main climate actors and situate them in the context of national capacity for adaptation. In section 6, we briefly discuss the case of Ghana for a comparative assessment in terms of policy and institutional framework to address climate change adaptation issues relative to Nigeria. Next, we draw some inferences on the use climate adaptation capacities in Nigeria and what need to be done for the country to be fully prepared to adapt its development to potential climate change impacts. In the final section of the report, we made recommendations about the critical entry points in which HBS can play a significant role in Nigeria's adaptation efforts in the context of supporting a coherent national response to climate change adaptation in Nigeria.

2. Nigeria's vulnerability to climate change

Climate change will affect everyone. Both the rich and the poor stand to lose. Those already affected by poverty, malnutrition and disease will face displacement and new hardships. All sectors of our socio-economic development, including the natural ecosystems, are vulnerable to climate change. In general, climate change presents significant threats to the achievement of the Millennium Development Goals especially those related to eliminating poverty and hunger and promoting environmental sustainability. Climate change would increase vulnerability and hinder or reverse the development process.

In Nigeria, the sectors which are considered most vulnerable to climate change are agriculture and food security, water resources, public health, and habitat (particularly the urban centres along the coast). Vulnerable regions are coastal regions (including deltas, especially those affected by storms and storm-induced floods) and erosion and desertification-prone areas in the southeastern and northern parts of the country. Vulnerable community includes farmers, fishers (especially those living in vulnerable region), the elderly, women, children and poor people living in urban areas.

Climate change is expected to increase the frequency and intensity of severe weather events. Sea level rise may lead to increasing coastal inundation and flooding of low-lying areas (e.g. Lagos and Port-Harcourt). Unfortunately, many States in Nigeria largely lack the infrastructure necessary to respond adequately to such events. Diseases such as malaria are likely to have wider ranges, impacting more poor people that are already most affected by such diseases.

Climate change will have direct impacts on biodiversity – from ecosystems to species level – and vary from region to region. While some species, like grasshoppers or other pests may increase in

abundance or range, climate change will increase existing risks of extinction of many threatened species or lead to loss of biodiversity.

Changing rainfall patterns could devastate the rain-fed agriculture on which so much of the population of Nigeria depends to survive. Increased occurrence of drought may lead to declining agricultural yields and diminished food security. Water supplies may also be altered, primarily through changes in temperature and rainfall.

Using the scenario analysis for temperature and rainfall for the vegetation zones of Nigeria which was extensively discussed in the First Communication of Nigeria to the United Nations Framework on Climate Change Convention (UNFCCC), Oladipo (2008) has shown that all sectors of Nigeria's socio-economic development, including the natural ecosystems, are vulnerable to climate change. A recent document by HBS Nigeria (2009) has also documented evidences of Nigeria's vulnerability to climate change. The following is a summary of what is at risk in Nigeria in the face of climate change.

Increase in the occurrence of extreme weather events

The frequency and intensity of extreme events, such as floods and droughts, has increased in many parts of Nigeria over the past few years. The country will fit into the following categories of extreme events depicted by IPCC (2007).

- (i) Warmer and more frequent hot days and nights over most land areas;
- (ii) Warmer and more frequent hot days and nights over most land areas;
- (iii) Warm spells / heat waves - Frequency increases over most land areas;
- (iv) Heavy precipitation events - Frequency (or proportion of total rainfall from heavy falls) increases over most areas;
- (v) Area affected by droughts increases.

It is reasonable to say that climate change will magnify natural disasters' severity in terms of intensity and frequency in Nigeria, but the nature and severity of the changes must be properly diagnosed.

Changes in temperature and rainfall

Based on the IPCC projection, the humid tropical zone of southern Nigeria which is already too hot and too wet is expected to be characterized by increase in both precipitation (especially at the peak of the rainy season) and temperature. Already, temperature increases of about 0.2°C - 0.3°C per decade have been observed in the various ecological zones of the country, while drought persistence has characterized the Sudan-Sahel regions, particularly since the late 1960s. For the tropically humid zones of Nigeria, precipitation increases of about 2 - 3% for each degree of global warming may be expected. Thus, it is reasonable to expect that the precipitation would probably increase by approximately 5 - 20% in the very humid areas of the forest regions and southern savanna areas.

In contrast, the savanna areas of northern Nigeria would probably have less rainfall, which, coupled with the temperature increases, would reduce soil moisture availability. This situation may be worsened by the expected decrease in rainfall with greater drought probabilities and larger inter-annual variability.

Increasing pressure on ecology and ecosystems

The severity of climate change impacts on the ecosystems depends, to a large extent, on the status of the flora and fauna. In particular, the forest ecology and the ecosystems that are already under significant human pressure would be adversely affected. Significant climate change and sea level rise would result in loss of biodiversity, rapid deterioration in land cover and depletion of water availability through destruction of catchments and aquifers. Persistent flooding and water logging due to accelerated sea level rise or extreme weather events could render forest regeneration more difficult.

The savanna biome of northern Nigeria would be very vulnerable to any climate-change-related dramatic reduction in rainfall in the region. This could result wide spread degradation of habitats. Thus, climate change and sea level rise could affect the boundaries of the ecosystems and the mix of the species that compose them, such that the distribution of new patterns of plant and animal communities would be a reflection of how the different ecosystems have been able to adapt to the expected climates.

Increasing vulnerability to soil erosion and flooding

As a consequence of climate change, some areas will start receiving heavier and steadier rainfall and such areas will inevitably begin to experience increased rainfall-induced erosion. As a corollary, in the arid northern parts of Nigeria, higher temperatures will contribute to dry conditions which underlie accelerated wind erosion. These are extremely serious situations given that soil erosion is already of catastrophic proportions in Nigeria whether viewed as gullying or sheet erosion while floods annually ravage many parts of the country during the rainy season. For example, it is estimated that in Abia, Anambra and Imo States, there are no fewer than 600 gully erosion sites. The recent massive landslide in one of the Southeastern States is an attestation to the possible climate change-induced changes in erosion intensity.

As a result of widespread reduction of vegetation cover, all parts of the country are vulnerable to soil erosion resulting from climate change either in terms of removal of soil by wind and rain or deposition of same in low-lying and down-wind locations.

Impacts on agriculture

One of the sectors most sensitive to global warming is agriculture. Under a “business as usual scenario”, agricultural productivity in general could decline between 10 to 25 per cent by 2080. For some parts of the country, the decline in yield in rainfed agriculture could be as much as 50 percent. Such trends clearly threaten the achievement of the Millennium Development Goals (MDGs).

Rural households engaged as subsistence and smallholder farmers are most vulnerable to the impacts of climate change on agriculture. They may be affected in the following ways:

- increased likelihood of crop failure;
- increase in diseases and mortality of livestock, and/or forced sales of livestock at disadvantageous prices;
- increased livelihood insecurity, resulting in assets sale, indebtedness, out-migration and dependency on food aid; and
- downward spiral in human development indicators, such as health and education.

Such impacts will further aggravate the stresses already associated with subsistence production, such as isolated location, small farm size, informal land tenure, low levels of technology and narrow employment options, in addition to unpredictable and uneven exposure to world markets that smallholder farmers particularly risk-prone in the face of climate change.

Indirect effects of climate change on agriculture include the effects on pests and diseases and the impacts of these on agricultural production, the impacts on health, and the impacts on agro-related socio-economic activities. Various pests, including rice stink bug, lima-bean pod borer, rice weevil, and soybean pod borer would probably expand their distribution areas in the event of climate change.

In general, the various impacts of climate change on crop production in the country could have tremendous impact on income, employment and food production. There would also be significant impacts on the characteristics of labour, employment and population processes and their characteristics.

Impacts on water resources

Climate change would result in increased variability in rainfall, predictably resulting in floods in some humid areas to the south in the country and decrease in precipitation resulting in droughts in the largely guinea-savanna in the north. Thus, the characteristics of the component of the hydro-climatological systems of the different ecological zones in the country would be altered, with their consequences on the availability of water resources.

Higher temperatures changes will affect the amount of runoff that becomes groundwater - the main source of water supply in many parts of the country. Similarly, reduced rainfall, particularly in the northern part would further compound the inability of the zone to meet people's demand for water. The northern part of the country may increase its dependence on underground water sources. But decreased rainfall would lead to lower water tables and this could increase the water stress and problems of environmental sustainability and water resources management futures.

Climate change will affect water use in all socio-economic sectors and consequently demand for water. Of particular significance is the fact that reduced river flow will reduce hydropower reservoir storage and thus reduce potential energy production. Already, there is increased concern that marked fluctuations in the level of the waters in Kainji, Jebba and Shiroro dams in

the State due to observed changes in climate is disrupting electricity generation from the hydro power stations.

Impacts on forests

Most of the forest products are consumed directly by the households collecting them. The direct use values of forests come from harvesting of fuel wood and poles for construction of houses and fences (mostly consumed by rural households) and the consumption of other forest products like plant products for craft production, food, medicine and cosmetics. Although there are no quantitative estimates for the country, forest use can contribute significantly to the GDP. In Namibia, for example, forest use is estimated to be contributing up to 3 per cent to national income (Reid, et. al., 2007).

In accordance with the study by Reid et.al., (2007) the areas with broadleaf woodlands in the southern part of the country are likely to experience no particular losses due to climate change. Indeed it is thought that the potential to use forest products here could increase. However, in the more arid zone to the north, potential benefits from climate change might be offset by increases in tree damage from fire.

Coastal and marine environment

The coastline of Nigeria is already undergoing pronounced morphological changes as a result of natural and anthropogenic activities. The natural phenomena include occasional sea surges and tidal waves, while human activities include (i) haphazard construction of ill-designed jetties and groynes, (ii) sand mining, (iii) unplanned and accelerated infrastructural development, (iv) pollution and (v) general land degradation. Accelerated sea level rise (ASLR) of 0.5 - 1m that is anticipated for Nigeria would most likely worsen these problems. In general, sea level rise impact in general will include (i) inundation and flooding, (ii) exacerbation of coastal erosion, (iii) increased frequency of ocean storm surges, (iv) changes in ocean dynamics, which could have effects on fishery resources, and (v) migration and nutrient distribution patterns, Resources, migration and nutrient distribution patterns (Awosika, L and Folorunsho, R., 2009). Many low lying areas will be affected by ASLR and increased flooding from storm surges due to global warming. Beach erosion could pose more threat as a result of ill-designed jetties/groynes which could cause alterations in current directions with the result that erosion could shift to other places as being witnessed on the Bar Beach on Victoria Island, Lagos. The filling up of some mangrove wetlands for development is already causing flooding in many areas and could be worsened by climate-change related ASLR.

With specific reference to the Niger Delta, it is estimated that with an accelerated sea level rise (ASLR) of about 0.5m, about 35% of the delta could be lost. With ASLR of about 1.0 m about 75% of the delta could be lost. The number of people at risk, assuming no measure and development, would be 0.9 million, 2.10 million and 4.50 million with ASLR of about 0.2 m., 0.5 m., and 1.0 m respectively, resulting in massive *environmental refugee*. With the projected climate change and sea level rise the capital values at risk would be about \$8.05 billion and \$17.5 billion respectively with ASLR of 0.2 m and 1.0 m. with no development and no mitigation/adaptation measures.

Impact on socio-economic and socio-cultural sectors

Energy

Climate change will have significant effects on the energy sector in Nigeria. In particular, rising temperatures, changes in the amount of precipitation and variation in humidity, wind patterns and the number of sunny days per year, could affect both consumption and production of energy. These impacts would be profound, although the nature and magnitude of the impacts may not be easy to predict.

In general, both energy supply and demand would be affected by climate change and sea level rise. Obviously, increased temperatures would result in increased energy demand for air conditioning, refrigeration and other household uses. Water pumping requirements may increase significantly in response to increased water need for irrigation and residential, commercial, and municipal water use to off set temperature increases. This will be very critical in this era of energy deficiency in the country.

Mining

Mining represents a major socio-economic sector in Nigeria. In the Niger Delta alone, total investment in oil mining amount to over US \$13 billion, most of which is under threat from climate-change related sea level rise. Considerable losses will thus be incurred in terms of investments and developments of the Niger Delta, particularly with respect to Government revenue in oil and oil-based industries such as oil refineries in coastal cities (e.g. Port Harcourt and Warri) and damage to many infrastructure and social amenities.

Industry

In general, some industrial products (e.g. food and drinks) are weather dependent and many industries are vulnerable to extreme weather conditions. For example, severe storms are detrimental to many industries including offshore oil, and gas drilling and fisheries that dominate the coastal zone of Nigeria. Some industries are also dependent on availability of local resources, which may be affected by changes in the climate. Variations in the production costs of crops, domestic animals, fish, wood, water and mineral resources due to climate change and sea level rise, would affect, for instance, industries processing agricultural products, hydroelectricity generation and aluminum industry. Changed biological diversity, which may result from climate change, could also hamper the development of agricultural and pharmaceutical products. The loss of coastal zones, mangroves forests and wetlands, would affect fisheries and many other economic activities based on the species in these habitats. Such vulnerability could result in forced relocation, loss of revenue and inability to continue operations.

Population and settlements

Climate Change would also directly or indirectly affect population and human settlements in Nigeria. In general, about 15% of the country's population is presently affected by climatic variation and sea level changes. With climate change, between 50% and 60% of the population would be affected. Global warming-related extreme events such as floods (resulting landslides in

some areas) strong winds, droughts and tidal waves could cause massive relocation of people. They could contribute to increased population movement via (a) declining agricultural productivity (b) managed and unmanaged retreat from land which is vulnerable to sea level rise and (c) temporary displacement. Declining agricultural productivity that has been a major trigger for population movement in the country could be worsened, especially in the semi-arid and arid zones of northern Nigeria.

Health

The human health impacts of climate change in Nigeria would occur in various ways and because of the poor health status of many citizens, the impacts could be devastating. The impacts could either be direct or indirect. Some of the direct impacts of climate change on health in Nigeria would include deaths, stroke, illness and injury due to increased exposure to heat waves and effects upon respiratory systems. Indirect effects of climate change and sea level rise include altered spread and transmission of vector-borne diseases (including malaria etc.) and altered transmission of contagious diseases (including cholera, influenza etc).

Tourism

Tourism, one of Nigeria's fastest growing industries, is based on wildlife, natural reserves, coastal resorts, and an abundant water supply for recreation. Many tourist attractions are located along the coastal zone of the country. Thus, any significant sea level rise due to global warming and climate change would impact on these tourist attractions that range from modern architectural basis through traditional relics to recreational grounds like beaches. Many beaches (e.g. the Victoria Island beach) in Nigeria will be lost. River deltas and maritime wetlands are also potentially endangered, while the existence of coastal settlements, including large cities, is threatened. With the destruction of a lot of these features, most of the socio-cultural features (e.g., the first Christian Church in Badagry, near Lagos) will be threatened. Those tourist-attracting traditional festivals (e.g. Argungu festival on river Argungu in Kebbi State) may decline to the extent that climate change induces shrinkage of such rivers. The anticipated loss of wildlife following the destruction of wildlife sanctuaries and reserves due to reduced vegetation as a result of climate change would discourage tourism.

Transport

Nigeria's transport systems will not escape the effects of global warming and climate change. For example, higher sea level rise may require costly changes to other ports and coastal roads and railways as the current means of communications along the coast may be covered by the intruding sea water or washed away by erosion. Changes in lake and river levels would also affect inland navigation. More frequent storms would affect shipping and other forms of transport. Also increased temperatures will exacerbate the problems of road and railways, as for example, the roads will become very hot for vehicle tires. Increased temperatures may also expose these vehicles to increased hazards of road accidents. Also, increased hot weather could cause increased rail length and consequently potential hazards of rail transportation. Any change in prevailing winds and increased dust haze would affect the safety and efficiency of take-off of flights. Airports near the ocean may also be vulnerable to sea level rise. If sea level should rise,

for instance, drainage would be needed at the international airports of Lagos and Port Harcourt and other coastal airports.

In summary, many sectors of the country's development will be affected by climate change induced by global warming. With nearly 70% of the country's population depending on agriculture for sustainable livelihoods, and agriculture still contributing nearly 40% of the country's GDP, the country is highly vulnerable to climate variability and long-term climate change, which could result in higher food prices, and lower domestic revenues.

The impacts will vary in extent, severity and intensity, but the exact degree still remains uncertain. Of course these impacts are not going to be felt overnight, and one could therefore argue that the structure of the economy will gradually change during the actual time period before the impacts are likely to be fully realized. Consequently, it is important to note that these potential impacts only serve as rough indications of what may likely happen if the current trends in temperature and rainfall changes persist, and if no adaptation and other adjustments take place. They serve as general guidelines for future policy directions and the imperative to take immediate action without waiting for the potential calamitous effects of climate change on the economy and livelihoods of the people to take place.

3. Climate capacity development framework

Climate change is adding a new challenge to Nigeria's development efforts. Overcoming the development challenge of climate change requires that more extensive adaptation than is currently being applied is necessary to reduce vulnerability to future climate change. Future vulnerability will depend not only on the degree of climate change but also on the development "pathway" taken, as well as capacity put in place to cope with the climate change stress. Enhancing the adaptive capacity and increasing resilience can accelerate the pace of progress towards sustainable development. In this regard, any effective national development planning process and effort must take climate change into account—and, more particularly, must facilitate adaptation to the effects of climate change. In particular, adaptation needs to be mainstreamed into aid programs and projects.

Efforts to mainstream adaptation into development efforts raise a fundamental issue about what constitutes adaptation to climate change. Adaptation to climate change is complex and presents a number of challenges. Even its definition remains problematic². According to UNDP (2008), how we define adaptation in operational terms will ultimately have significant political and financial implications. Whatever definition is used, adaptation is closely linked with development and this linkage is critical to reducing vulnerability (or increasing resilience) to climate change. Sustainable development in particular can reduce vulnerability to climate change.

² The IPCC broad definition of adaptation to climate change puts it as *an adjustment in natural or human systems to actual or expected climatic stimuli or their effects, which moderates harm or exploits beneficial opportunities*. AMCEN (2008) described adaptation as *"a process, beginning with understanding current vulnerability, building capacity to support adaptation planning and implementation, learning from pilot actions and deploying strategies and measures to operationalize climate change adaptation in vulnerable regions, sectors and populations"*.

Adapting to climate change involves reducing exposure and sensitivity and increasing adaptive capacity to build a “climate-resilient society”. Building a climate-resilient society, that is able to withstand or recover quickly from difficult conditions caused by the adverse effects of climate change, including climate-related hazards and disasters depends on a number of factors, including environmental, social, economic, technological and political (including policy) factors. For example, a country with an intact natural ecosystem is likely to be more resilient to climate risks. Similarly, a country with effective policies for both mitigation and adaptation and with more financial and technological resources (e.g., an effective early warning system) for mitigation and adaptation (including climate-related disaster preparedness), is more able, and hence less vulnerable, to the adverse effects of climate change. Strengthening of coping or adaptive capacity is crucial in ensuring a climate-resilient society or a society with reduced risk to the adverse effects of climate change.

Capacity development for climate change action falls in the general realm of capacity development for the environment that became the focus of discourse after the Rio Summit. Following the work of the Organisation for Economic Cooperation and Development (OECD), we define climate capacity as the ability of individuals, groups, organisations and institutions to address climate issues as part of a range of efforts to achieve sustainable development (OECD 1995). From a national capacity-needs perspective, climate capacity assumes five dimensions: (i) knowledge and analysis, (ii) enabling policy environment in terms of the existence of strategies and policies as well as institutional mechanisms, (iii) implementation of actions, (iv) financing, and (iv) active involvement in international climate negotiations. Most of these dimensions are considered in this study.

We followed the approach adopted by the OECD (1995) to assess climate change capacity at three different levels: the individual level, the organizational or institutional level and the systemic level. The individual level concerns all *relevant actual and potential actors* (e. g. policymakers, negotiators, the private sector, and local population) who carry out tasks or functions related to climate change management and participate in the climate policy process. Individual climate capacity depends on the availability, the knowledge and skills, as well as the performance of human resources.

Climate capacity at the organizational level focuses on *overall organizational performance and management capacities*. They include, for example, the existence of an organization with a specific mandate on climate change or of a specific climate unit within organization.

The systemic level focuses on the creation of *enabling environment*, such as the overall policy, economic, regulatory, and accountability frameworks within which organizations and individuals operate. It relates to the long-term framework conditions for climate action and therefore the opportunity structure of climate actors. In the proposed OECD framework, it comprises three dimensions: (i) economic-technological (i. e. the structural features of economy and society as well as the availability of climate-relevant economic, financial and technological resources); (ii) political-institutional (i. e. governance arrangements, administrative structures and procedures as well as climate-related policies and laws which influence participation and the coordination of policies and activities of public administration and other relevant actors); and cognitive-

informational (i. e. the existence of climate-related information and the degree of public awareness and concern about climate problems).

4. Study Methodology

The study uses the above framework conditions and dimensions to assess existing climate adaptation capacities and preparedness of Nigeria, and how these capacities are being utilized. It also sought to establish the extent to which the national sector policies incorporate strategies for mainstreaming or supporting climate change adaptation issues.

The principal methodology involved review of the existing policy frameworks and stakeholder consultation on the various aspects of climate change adaptation. The stakeholder consultation process involved discussions with a wide cross-section of stakeholders in the public (Federal and State levels) and private sectors, including non-governmental organizations (NGOs). To overcome some of the constraints encountered in conducting stakeholder consultations, particularly at the national level, the study used attendance at national training climate change-related workshops³ and telephone conversations with relevant focal points as well as scoping of available information through the internet. In addition, a questionnaire was designed and distributed to a number of stakeholders to source relevant information where formal face-to-face consultation was difficult. A sample of the questionnaire is attached as Annex II. Initial contact with Ghana sources of information was through correspondence, and telephone conversations, as well as information scoping in the internet on climate change adaptation activities in that country.

5. Major Findings

5.1 Constitutional and Legislative Framework

Apart from the constitution, Nigeria has very few laws to back the policies that have either explicit or implicit implications for climate change adaptation within the environmental context. The environmental objectives and directive of State Policy on the Environment contained in the Constitution state that, *the State shall protect and improve the environment and safeguard the water, air and land, forest and wildlife of Nigeria* (Constitution, Chapter 2, Article 28). In an effort to develop a framework within which the goals of protecting and improving the environment can be realized, the Constitution allocates certain legislative competencies to each of the three tiers of government (Federal, State and Local). The responsibility for applying the legislation falls to the judiciary, and the constitution recognizes the specific competencies of the National Assembly, the State Assemblies and the Local Government Councils.

The House and Senate Committees on the Environment of the National Assembly are given primary responsibility for the review and oversight of the existing environmental legislation, the collection and analysis of relevant information, and the development of informed draft legislation designed to strengthen the legal framework for environmental management. These

³ The consultant attended (i) the World Bank Scoping Mission on Climate Change Assessment (9-10 February 2010); (ii) UNFCCC NEEDS Project initiation to assess the financial needs of climate change activities in Nigeria (18 -19 February 2010); and (iii) Post-Copenhagen Roundtable (22- 23 February 2010) at his own expense.

committees are each comprised of five sub-committees - Biodiversity Conservation, Desertification, Erosion and Flood Control, Industrial Waste Management and Pollution Control. It is the responsibility of these subcommittees to focus on strengthening the legislative framework relevant to their assigned technical areas. The National Assembly is at an advanced stage of legislating for a Climate Change Commission in the country.

A few of other relevant legislations that may have explicit and implicit implications for climate change, at least within the environment context, are given below :

Federal Environmental Protection Agency Decree 58 of 1988 (FEPA) was the first encompassing legislative framework for environmental protection by the Federal Government of Nigeria. It created the Federal Environmental Protection Agency (FEPA), and was amended by Decree No. 59 of 1992. This legislation vests in FEPA overall responsibility for the protection and development of the environment, biodiversity conservation and sustainable development of Nigerian's natural resources in general and environmental technology, including initiation of policy related to environmental research and technology, among other functions. Section 37 of the decree charges FEPA further with the responsibility of making regulations generally for air and water quality, atmospheric and ozone protection, as well as noise control and control of hazardous substances for sustainable development.

The Federal Environmental protection Agency Act – retained as Cap F10LFN 2004 - was repealed in 2007 by the NESREA Act 2007

The **NESREA Act of 2007** established the National Environmental Standards and Regulations Enforcement Agency (NESREA) as an Agency of the Federal Ministry of Environment that is charged with the responsibility of enforcing environmental Laws, regulations and standard in deterring people, industries and organization from polluting and degrading the environment. NESREA has responsibility for the protection and development of the environment, biodiversity conservation and sustainable development of Nigeria's natural resources in general and environmental technology including coordination, and liaison with, relevant stakeholders within and outside Nigeria on matters of enforcement of environmental standards, regulations, rules, laws, policies and guidelines, all of which have critical relationships with issues of climate change.

National Environmental Regulations: NESREA has recently succeeded in getting the Federal Government to gazette a number of regulations to have implicit implications for climate change adaptation. It is in the process of getting many other relevant regulations passed by the government.

The key adaptation relevant gazetted regulations include:

- i. Watershed, Mountainous, Hilly and Catchment Areas Regulations, 2009:** These are to control activities in mountainous, hilly and catchment areas which are inconsistent with good land management practices, especially in areas prone to (climate extreme events induced) landslides, floods, drought, desertification, siltation, heavy sediment loads, falling rocks, fires and damage by wind.

- ii. **Wetlands, River Banks and Lake Shores Regulations, 2009:** The key objectives of these regulations that have good implications for climate change adaptation are to (a) provide for the conservation and wise use of wetlands and their resources in Nigeria; (b) ensure water catchments conservation and flood control; (c) ensure the sustainable use of wetlands for ecological and tourism purposes for the common good of the citizens; (d) ensure that the country's wetlands are protected as habitats for species of fauna and flora; and (e) minimize and control pollution.
- iii. **Ozone Layer Protections Regulations 2009,** which prohibit the production and use of ozone-depleting substances (ODS).

The following adaptation relevant regulations have been drafted and are awaiting Federal Government:

- i. **Desertification Control and Drought Mitigation Regulations, 2010:** These regulations explicitly mentioned climate change in some of its key objectives that include, among others: (a) attaining 25% forest cover .. for the enhancement of ecological integrity and the *abatement of the impacts of climate change*; (b) ensuring sustainable agriculture and range management practices, improved animal husbandry and management of water resources in the desertification prone areas with a view to achieving sustainable livelihoods, poverty reduction and wealth creation through the introduction of modern and affordable production technologies to resource poor farming communities; (c) promoting cooperation with relevant international and non-governmental organizations through partnerships, knowledge sharing and the domestication of such conventions as the UNCCD, UNCBD and UNFCCC to which Nigeria is a signatory.
- ii. **Soil Erosion and Flood Control Regulations, 2010:** The main objectives of these regulations are to: (a) protect human life and the environment; (b) minimize loses due to flood and erosion and their effects on vulnerable areas by regulating land-distributing activities; and (c) control accelerated soil erosion, flooding and sediment deposition in water bodies and water courses in order to prevent pollution of these water resources.
- iii. **Coastal and Marine Area Protection Regulations, 2010:** The main objective of these regulations that has relevance to adaptation id ensuring the protection of the coastal and marine environment of Nigeria through the application of preventive, precautionary and anticipatory approaches to avoid degradation of the marine environment, as well as to reduce the risk of long-term or irreversible effects on the coastal and marine environment.
- iv. **Control of Bush Forest Fire and Open Burning Regulations, 2010:** The principal thrust if there regulations is to prevent and minimize the destruction of ecosystem through fire outbreak and burning of any material that may affect ecosystem's health through emission of hazardous air pollutants.
- v. **Surface and Ground Water Quality Control Regulations, 2010,** which have the main

purpose of restoring, preserving and enhancing the physical, chemical and biological integrity of the country's surface and ground water resources, and to maintain existing water uses.

The **Water Resources Act 101 of 1993** enables the Federal Government of Nigeria to regulate, develop, and license all water operators in Nigeria. This includes planning, development, and usage of Nigeria's water resources, ensuring quality, quantity, distribution, use and management of water, ensuring application of appropriate standards and techniques for investigation, use control, protection, management and administration of water resources, facilitating technical assistance and rehabilitation for water supplies etc.

While the Water Act may not address the issue of adaptation of water resources to climate change directly, it provides a broad framework for actions that the government of Nigeria may take in times of anticipated shortage of or surplus water (*which may be climate change induced*), as well as ensuring adequate supply of suitable water for animals, irrigation, agriculture, domestic and non domestic use, generation of hydro electrical energy, navigation and recreation, drainage, safe disposal of sewage, prevention from pollution, prevention from flooding, soil erosion, reclamation of land, protection of the environment etc.

Other laws:

In addition to the above mentioned policies and strategies, Nigeria has many laws and regulatory measures to promote sustainable environmental management in many sectors of the economy. Some of the critical laws that may have influence on climate change response, particularly as they relate to ecosystem adaptation, include (a) *National Park Service Act* – retained as Cap N65 LFN 2004 (for conservation and protection of natural resources (wildlife and plants) in national parks; (b) *Endangered Species (Control of International Trade and Traffic) Act*- retained as Cap E9 LFN 2004 (conservation of wild life and protection of threatened and endangered species).

5.2 Climate Change Adaptation Relevant Policies, Strategies and Plans

As mentioned in Section 3, climate-relevant policies are part of the political framework conditions and an important outcome of the political process of a country. This is because they limit and reflect the uses made of climate capacities of that country. A country with a focused climate change policy and mitigation and adaptation strategies should be in a better stage of preparedness to respond to climate change impacts than a country that has none. Sustainable policies are prerequisites for a strong national adaptive capacity.

So, how has Nigeria responded to climate change threats in the context of policy framework? This remains a major challenge for the country. As discussed in section 2, Nigeria is very vulnerable to climate change. Despite its high dependence on fossil fuel, Nigeria still has a very large share of its economy in climate-sensitive sectors. For example, agriculture still accounts for

about 40% of the GDP. It also has a very large proportion of urban population that is vulnerable to sea-level rise. Nigeria also has a number sensitive ecosystems that threatened by climate change. Yet the country is just in the process of developing a climate change policy and response strategy.

However, there are a number of national policies and plans that are either explicitly or indirectly addressing climate change adaptation. In this section, we discuss some of the key national policies and highlighted their climate change related features, particularly with respect to the extent to which they can potentially support climate change adaptation measures and thereby enhance the country's adaptive capacity.

5.2.1 National Environmental Policy

Towards meeting the challenges of addressing the key environmental problems and challenges of land degradation (deforestation, desertification and coastal and marine environment erosion), and air and water pollution, urban decay and municipal waste, as well as hazards of drought, coastal surges, floods and erosion, the Nigerian government elaborated a *National Environmental Policy* in 1989. The policy was revised 1999 to accommodate new and emerging environmental concerns.

The goal of the revised the *National Environmental Policy* is to achieve sustainable development in Nigeria and, in particular to:

- i. Secure for all Nigerians a quality environment adequate for their health and well-being.
- ii. Conserve and use the environment and natural resources for the benefit of present and future generations.
- iii. Restore, maintain and enhance ecosystems and ecological processes essential for the functioning of the biosphere and for the preservation of biological diversity and to adopt the principle of optimum sustainable yield in the use of living natural resources and ecosystems.
- iv. Raise public awareness and promote understanding of essential linkages between environment and development and to encourage individual and community participation in environmental improvement efforts.
- v. Co-operate in good faith with other countries, international organizations and agencies to achieve optimal use of transboundary natural resources and effective prevention or abatement of transboundary environmental pollution

By identifying key sectors requiring integration of environmental concerns and sustainability with development and providing guidelines for achieving sustainable development in about fourteen sectors of Nigeria's economy (i.e. Human Population; Land Use and Soil Conservation; Water Resources Management; Forestry, Wildlife and Protected Natural Areas; Marine and Coastal Area Resources; Sanitation and Waste Management; Toxic and Hazardous Substances; Mining and Mineral Resources; Agricultural Chemicals; Energy Production; Air Pollution; Noise in the Working Environment; Settlements; Recreational Space, Green Belts, Monuments, and

Cultural Property), this policy, by extension, has addressed a number of adaptation related responses.

In an attempt to implement the Environmental Policy, Nigeria has enacted specific policies and action plans that, if properly implemented could be adapted to support national climate change adaptation response efforts, particularly with respect to:

- (i) ***drought and desertification*** (National Policy on Drought and Desertification; Drought Preparedness Plan, 2007);
- (ii) ***erosion, flood control and coastal zone management*** (National Policy on Erosion, Flood Control and Coastal Zone Management, 2005);
- (iv) ***forestry*** (Draft National Forest Policy, 2006);
- (v) ***biodiversity protection*** (National Biodiversity Strategy and Action Plan, 2004);

5.2.2 Drought and Desertification Policy

The *National Policy on Drought and Desertification* (NPDD) recognizes that climate change could intensify drought and desertification in the northern part of the country that are very prone to these environmental problems. In this regard, specific strategies must be implemented to moderate the negative impacts of climate change on drought and desertification. The specific focus of the policy with respect to climate change is the equipment of relevant agencies, institutions and citizens adequately to collect, analyze and use climate data effectively to ameliorate and combat drought and desertification in Nigeria.

Some of the implementation strategies for the policy that implicitly indicate climate change adaptation preparedness include: (i) strengthening of agencies, institutions and facilities for the collection and analyses of meteorological and hydrological as well as for dissemination of information; (ii) upgrading the existing national early warning facilities for more efficient service delivery; (iii) developing appropriate awareness programmes for formal and informal education to enhance knowledge on climate and environment issues; and (iv) encouraging appropriate land use that enhances carbon dioxide sequestration, such as afforestation, reforestation and agro-forestry. This also reduces soil erosion and increase crop productivity for economic development.

The NPDD was preceded by a *National Action Programme (NAP) to Combat Desertification and Mitigate the Effects of Drought* was developed in 2000, and it remains the main implementation modality for the policy. NAP was developed in line with Article 10 of the UN Convention to Combat Desertification as a key operational tool for the implementation of the Convention. The document spells out long-term integrated strategies that focus simultaneously on improved productivity of land, and the rehabilitation resources in dry sub-humid, semi and arid areas of Nigeria, with particular emphasis on agriculture, water resources management and environmental rehabilitation, regeneration and conservation.

In addition, Nigeria has in place a Drought Preparedness Plan (2005) which, although may not have explicitly addressed climate change, contains a number of adaptation strategies in some of its specific objectives.

The specific objectives of the Drought Preparedness Plan are:

- (a) To serve as a framework for drought monitoring and the implementation of mitigation measures with the overall objective of reducing the vulnerability of the Nigerian environment and human populations to the impacts of drought.
- (b) To collect and analyse drought-related information in a timely and systematic manner
- (c) To establish criteria for declaring drought emergencies and triggering various mitigation and response activities
- (d) To provide an organizational structure and delivery system this assures information flow between and within various levels of government
- (e) To define the duties and responsibilities of all agencies with respect to drought management
- (f) To maintain a current inventory of state and federal programmes used in assessing and responding to drought emergencies
- (g) To identify drought-prone areas and vulnerable economic sectors
- (h) To identify mitigation actions, which can be taken to address vulnerabilities and reduce drought, impacts
- (i) To provide a mechanism to ensure timely and accurate assessment of drought impacts on the environment as well as socio-economic impacts
- (j) To keep the public informed of current conditions and response actions by providing accurate and timely information to media in print and electronic form
- (k) To establish and pursue a strategy to remove obstacles to the equitable allocation of water during shortages and establish requirements or provide incentives to encourage water conservation
- (l) To establish a set of procedures to continually evaluate and exercise the plan and periodically revise it, so that it will stay responsive to the needs of the community
- (m) To identify principal activities, groups or areas most at risk and develop mitigation actions and programmes that reduce drought vulnerabilities.

5.2.3 Forest Policy

The *National Forest Policy (NFP) of 2006* has the overall objective of achieving sustainable forest management that would ensure sustainable increases in the economic, social and environmental benefits from forests and trees for the present and future generation including the poor and the vulnerable groups.

A number of the specific objectives of the *National Forest Policy* have significant implications for climate change adaptation strategies. Among these are the need to:

- (i) Increase, maintain and enhance the national forest estate through sound forest management

- practices.
- (ii) Address the underlying causes of deforestation, desertification including lack of policy support, market distortions, weak regulations and rural poverty.
 - (iii) Encourage forest dependent people, farmers and local communities to improve their livelihood through new approaches to forestry.
 - (iv) Rehabilitate and conserve key watershed forests.
 - (v) Promote and maintain the greening of the urban environment, and meet the increasing demand for forest products by urban centers.
 - (vi) Help private owners and communities to reserve land for forestry.
 - (vii) Build capacity and systems for state and local government to engage actively in forest resources management and development.
 - (viii) Develop and promote responsive, affordable, well-informed and decentralized forestry advisory services to farmers, communities and the forest industry.

There is also the *National Forestry Action Programme (NFAP)* which is geared towards ensuring sustainable forest management, promoting participatory process of development, facilitating private sector – forestry development and adopting an integrated approach to forestry development. It comprises of 3 sub-programmes viz: forest management, social forestry and forest industries.

In the process of implementing the NFP in line with the NFAP, the Federal Government is currently embarking on a number of afforestation programmes. Under the guidance of the African Union Commission, Nigeria is keying into the project on the “Green Wall Initiative.” For this, a “green wall” of trees will be planted across the dry-land area of Nigeria to push back deforestation and secure agriculture and livelihoods across the Sudano-Sahelian zone of the country. This initiative will address not only climate change, but the UN Millennium development goals as well. In addition, there is also the Presidential Initiative on Afforestation Programme for Environmental Sustainability targets about 40 million trees to be planted annually.

5.2.4 National Biodiversity Strategy and Action Plan

The *National Biodiversity Strategy and Action Plan (NBSAP)* provides a framework and programme instrument for the conservation of Nigeria’s biological diversity and its sustainable use by integrating biodiversity considerations into national planning, policy and decision-making processes. It provides frameworks for addressing (i) biodiversity conservation, (ii) sustainable use of biological resources, (iii) equitable sharing of benefits, (iv) conservation of agro-biodiversity, (v) biosafety, and (vi) biodiversity-industry interface, each with different policy perspectives.

The goal of the NBSAP is to conserve and promote sustainable use of Nigeria’s biological resources for poverty reduction and for fair and equitable benefits among the present and future generations. Climate change is mentioned in two key strategic directions for biodiversity conservation in the NBSAP. They emphasize (i) *the monitoring of the effects of climate change on ecosystems, species and genetic diversity* and (ii) *developing linkages in the implementation of*

the UN Conventions on Climatic Change, Desertification, Biological Diversity and Persistent Organic Pollutants.

Proposed strategic directions proposed in the NBSAP that have significant relevance to adaptation.

- Promoting and enhancing measures for both *in-situ* and *ex-situ* conservation.
- Expanding and strengthening the network of protected areas to include all the major ecosystems: Savanna, High forests, Wetlands, Mangrove, Montane, Coastal and Marine.
- Restoring and establishing grazing reserves and stock routes for nomadic pastoralists.
- Protecting watersheds along all intra and interstate watercourses to protect the water bodies and aquatic biodiversities.
- Developing and implementing restoration/rehabilitation plans in degraded ecosystems.
- Implementing measures to eliminate environmental pollution that adversely affect biodiversity.
- Integrating farming systems that are compatible to biodiversity as a means of poverty reduction and within the context of national planning.
- Reviewing government policies and programmes that create unintentional adverse impacts on biodiversity.
- Strengthening measures to reduce and eliminate the release of substances that are harmful to ecosystems, species and genetic resources.
- Revising/preparing and implementing legislations and policies, inventories, plans, guidelines, monitoring programs and other measures to support the establishment and management of protected areas.
- Participating in international efforts (*including climate change negotiations*)⁴ to coordinate and enhance activities related to biodiversity conservation.

5.2.5 National Erosion and Flood Control Policy

The goal of the *National Erosion and Flood Control Policy* (NEFCP) of 2005 is to protect the environment from degradation, loss of productive land and negative impacts of flood. ensure coordinated and systematic measures in the management and control of the hazards of erosion and floods to reduce their impacts on the people and the environment.

Although there is no explicit mention of climate change in the NEFCP, some of its key strategies of implementation that are implicitly related to climate adaptation include: (i) producing flood vulnerability and erosion hazard maps for all the ecological zones of the country; (ii) evolving a mechanism for forecasting, monitoring and control of erosion and floods; (iii) reviewing the land use laws and regulations; (iv) promoting and strengthening training at all levels in erosion and flood prevention, management and control; (v) creating public awareness to encourage participation; (iv) protect marginal lands by limiting utilization to their carrying capacity; (vi) subjecting resources users and developers to guidelines in order to reduce the vulnerability of the

⁴ Emphasis is mine

environment to flood and erosion-related disasters; and (vii) providing early warning systems to avert the escalation of flood and erosion hazards.

To implement the National Erosion and Flood Control Policy, an Action Plan was developed to (i) promote participatory approach to involve all stakeholders in the prevention and management of erosion and flood; (ii) adopt coordinated participation of all tiers of government in service delivery for erosion and flood control; (iii) create efficient institutional arrangements and legal framework for erosion and flood management; and (iv) facilitate sustainable funding mechanism for effective erosion and flood management. Several physical erosion and flood control projects are being implemented across the nation with support from the National Ecological Fund, and there is national campaign to raise awareness on erosion, all of which have the potentials to strengthen the country's adaptive capacity.

Government is implementing a number of initiatives to address a number of environmental challenges contained in the policies and strategies that we have reviewed. Towards combating desertification and mitigating drought, government is participating in the GreenWall Sahara Programme, which is designed to green the "desert" portion of Nigeria. It is also actively involved in the Desert to Food Programme initiative, as well as the integrated ecosystem management of the transboundary environmental resources between Nigeria and Niger Republic. In addition, government is supporting the rehabilitation of ten oases and provision of potable water to communities in desertification-prone areas of the country.

5.2.6 Agricultural Policy

The main objectives of the 2001 Nigerian Agricultural Policy include: (i) the achievement of self-sufficiency in basic food supply and the attainment of food security; (ii) increased production of agricultural raw materials for industries; (iii) increased production and processing of export crops, using improved production and processing technologies; (iv) generating gainful employment; (v) rational utilization of agricultural resources, improved protection of agricultural land resources from drought, desert encroachment, soil erosion and flood, and the general preservation of the environment for the sustainability of agricultural production; (vi) promotion of the increased application of modern technology to agricultural production; and, (vii) improvement in the quality of life of rural dwellers.

The policy framework covers many issues that may be impacted by climate change. They include (i) crops, livestock, fisheries and agro-forestry production, (ii) pest control, and (iii) water resources and irrigation.

Some of the key features of the Agricultural Policy with implicit adaptation implications include:

- Evolution of strategies that will ensure self-sufficiency and improvement in the level of technical and economic efficiency in food production. This is to be achieved through (i) the introduction and adoption of improved seeds and seed stock, (ii) adoption of improved husbandry and appropriate machinery and equipment, (iii) efficient utilization

of resources, (iv) encouragement of ecological specialization, and (v) recognition of the roles and potentials of small -scale farmers as the major producers of food in the country.

- Reduction of risks and uncertainties in agriculture, to be achieved through the introduction of a more comprehensive agricultural insurance scheme to reduce the natural hazard factor (*including climate change*) militating against agricultural production and security of investment.

A major initiative for the implementation of the Agricultural policy is the National Fadama Project, which started in 1991. It is in its third phase of implementation⁵. Its main objectives are to improve the quality of life of smallholder farmers, food security and rural infrastructure. Some of the main activities in the implementation of the National Fadama Project that are indicative of possible anticipatory adaptation measures include: (i) promotion of simple and low-cost improved irrigation technology, and (ii) enhancing the capacity of fadama users to adopt environmentally sustainable land management practices

5.2.7 Water Policy

The National Water Policy is still in draft. It seeks to improve on the nation's water resources management including the management of hydrological risks and vulnerabilities. Emphasis is for the assessment of water resources is to improve real time forecasting of hydrological phenomena. It is yet to be approved and legislated and it is also deficient on strategies on how to prevent such hazards/disasters. Nevertheless, the successful implementation of the policy should enhance its options for adaptation in water resources.

5.2.8 Coastal Environment

Nigeria has no clear policy directed at coastal zone management, and there has been persistent call for the country to have in place an integrated approach to coastal zone management. However, Nigeria is participating in the implementation of the UNDP/UNE/UNIDO/GEF project on *Combating coastal area degradation and living resources depletion in the Guinea Current Large Marine Ecosystem (GCLME) through regional actions*. A major output of this project implementation is the development of *Strategic Action Programme to address sustainable management of the environment of the sub-region*. Some of the remedial actions to address priority transboundary problems in the project portend good opportunity for anticipatory adaptation response to climate-induced changes to the coastal environment in Nigeria.

5.2.9 Vision 20:2020

⁵The objective of Fadama III is to increase food security, reduce poverty, and create employment and improved opportunities in rural areas by: (i) financing investments in productive community infrastructure to increase agricultural productivity and diversify sources of livelihood; (ii) building the capacity of community organizations to increase the stock of social capital; (iii) strengthening the capabilities of participating states and local governments to deliver services to the rural poor; and (iv) promoting socially-inclusive and environmentally sustainable management of natural resources.

Government is in the process of finalizing a ten-year plan for stimulating Nigeria's economic growth and launching the country onto a path of sustained and rapid socio-economic development. The blueprint, known as Vision 2020, articulates Nigeria's economic growth and development strategies for the ten-year period between 2010 and 2020, and will be implemented using a series of medium term development plans. Vision 2020 aims, among others, to reduce the impact of climate change on socio-economic development processes in the overall context of preserving the environment for socio-economic development. In that regard, it would (i) strengthen environmental governance; (ii) promote environmental education; (iii) optimize economic benefits from sustainable environmental management. But the Vision 2020 policy document is still at its infancy and needs to be fully legislated before the potential of mainstreaming climate change concerns into it can be realized. This will still take some time, judging from the slow process of policy initiation and implementation in Nigeria.

5.2.10 Summary of Analysis

An analysis of the above-mentioned legal framework and sectoral policies, strategies and plans indicates that Nigeria has many ongoing policy and strategy initiatives which activities, if properly implemented, can serve as adaptive climate change measures. For example, many of the initiatives in the National Action to Combat Desertification and in the implementation of the National Policy on Drought and Desertification (e.g. rehabilitation of oases) can be taken as anticipatory adaptation measures, even though they are not clearly spelt out. This is because they are capable of cushioning the effects of climate change on drought and desertification. Similarly, the Greenwall Initiative and Presidential Initiative on Afforestation, that are being implemented in the context of the Forest Policy initiative, will serve as anticipatory measures to combat desertification, land degradation and address climate change effects.

Similar inferences to the above can be made in the agriculture, water and even in the ongoing LME initiative for the coastal and marine environment. Thus we summarize that Nigeria has a number of policies, strategies and plans with potential of fine-tuning them into policy options for climate change adaptation in many vulnerable sectors of the country. These policies are capable of addressing desertification control, forests and ecosystem adaptation, and anticipatory policy options for water resources, agriculture and even the coastal and marine environment that is vulnerable to sea level rise.

A major constraint is that government has not been able to put in place a comprehensive implementation strategy that will enable these policies to translate into meaningful inter-sectoral activities for sustainable environmental management, which could easily make these policies to become anticipatory adaptation options for Nigeria's response to climate change. This is despite the fact that the issue of climate change has become of global prominence since the 1990s.

Despite the fact that Nigeria is a signatory to UNFCCC under the Non-Annex I parties, for which it is expected to meet some obligations (e.g. produce four key National Communications; produce National Adaptation Programme of Action, undertake vulnerability and adaptation assessment, produce four in-depth review summaries; etc) the country has no *National Climate Change Policy and Strategy* that should have presented Nigeria's current and future efforts to address climate change vulnerability and adaptation. The First National Communication was

produced November, 2003. A stakeholders' initiation workshop on the second National Communication (SNC) took place in December 2006, but it is yet to be finalized, and may not be so until sometime later in 2010.

The closest Nigeria is to having an acceptable adaptation response framework is a working document on *Adaptation Strategies of Action* prepared by HBS for the Special Climate Change Unit (SCCU) of the Federal Ministry of Environment, the Nationally Designated Authority for climate change in Nigeria. But there is no clear indication that the document has been adapted as a national plan of action. The SCCU is currently working in partnership with HBS, Nigerian Environmental Study Action Team (NEST), Nigeria Climate Action Network (NigeriaCAN) and the UNDP to develop a National Adaptation Strategy and Plan of Action (NASPA) that will identify priority activities to enable Nigeria to respond to the critical needs of adapting to climate change. In addition, government is embarking on the process of putting in place a climate change policy.

In general, the effectiveness of environmental and other policies in Nigeria, as well as their potentials to support adaptation and mitigation measures is yet to be fully realized. The policies are very broad and are not in position to provide the country the required focused response to adaptation concerns of the country. While climate change is mentioned in some key government policies, an indication of Nigeria's little or no preparedness for climate change adaptation and mitigation is lack of any specific policies or strategies for climate change sector activities. The policy framework for aligning human development and climate change management efforts is largely undeveloped in the country. Government recognizes the need to adapt exiting national policies, strategies and plans to address climate change response. Thus, it is ensuring that climate change adaptation and mitigation concerns are properly integrated into its current national development plan, known as Vision 20:2020.

5.3 Structural determinants of Nigeria's climate change adaptation capacities

In general, and as indicated in the framework described in section 4, the structural dimensions of any nation's climate adaptation capacities comprise socio-economic, resource-related, political, institutional and informational elements.

5.3.1 Institutional Factors

Nigeria has created a *Special Climate Change Unit* (SCCU) within the Federal Ministry of Environment with the Secretariat in Abuja, Nigeria. The Unit is created to implement the Convention and the protocol activities. The SCC Unit also has responsibility of coordinating the activities of the *Inter-ministerial Committee on Climate Change* with representation from the following ministries; Finance, Agriculture, water Resources, Energy Commission, Nigeria National Petroleum Corporation (NNPC), Foreign Affairs, Nigerian Meteorological Agency (NIMET), industry, NGOs (Nigerian Environmental Study/Action Team), and Academic (Centre for Climate Change and Fresh Water Resources, Federal University of Technology Minna; Centre for Energy , Research and Development, Obafemi Awolowo University Ile-Ife; and

Abubakar Tafawa Balewa University, Bauchi. There is also a *Presidential Implementation Committee on the Clean Development Mechanism (CDM)* in the Presidency. Towards improving the national capacity to generate observational climate data and climate monitoring systems, government upgraded the Department of Meteorology in the Ministry of Civil Aviation to a full-fledged Nigerian Meteorological Agency (NIMET) in 2003, which now has a Climate Research Unit for data generation and climatic information dissemination.

5.3.2 Political

A number of environmental objectives to protect and improve the environmental resources (air, land and water) of Nigeria have been enunciated in section 20 of the constitution of the Federal Republic of Nigeria. To this end the Senate has a standing committee on ecology (Senate Committee on Ecology) while the National House of Assembly has a standing Committee on Climate Change. Representative members of these Committees have in the past participated in regional and international forums on issues of climate change including in Abuja, Nigeria in September 2006 and in India in September 2007 during the 52nd and 53rd sessions of Commonwealth and Parliamentarians Conference, respectively. Members of these Committees have facilitated the passing of a Climate Change Commission (CCC) Bill in both the House and Senate. However, there is still no timeframe as to the time the CCC will take off. In addition to the Committees, there is a National Council on the Environment, made up of representatives of governments at the Federal and State levels. The Council meets at irregular intervals to take stock of the state of the environment in Nigeria.

5.3.3 Climate Change Negotiations

A measure of a nation's capacity to address climate change issues is its effectiveness in advancing international agreements to tackle the problem. In this regard, Nigeria has been very active. It strongly committed itself to the achievement of an effective and equitable international agreement on climate change in Copenhagen and beyond, and it recognized its leadership role in Africa in this regard.

Nigeria is party to the international effort to reach a new post-Kyoto new climate deal. In 2007, it participated in the 13th session of Conference of Parties (COP13) of the UNFCCC in Bali, Indonesia, during which the international community agreed upon a comprehensive 2-year process that eventually led to the now popular 15th session of the COP (COP15) in Copenhagen, Denmark in December 2009.

About 20 people represented Nigeria at the Bangkok Climate Change negotiation in September 2009. The team was made up of 10 Government delegates and 10 representatives of the NGOs. The Permanent Secretary of the Federal Ministry of Environment led the team. Similar number of delegates participated at the Barcelona Climate Change negotiation in November 2009. The climax of Nigeria's participation in international climate change negotiations came in December 2009 when over 300 delegates led by the Federal Minister of Foreign Affairs participated in the series of negotiations on (i) mitigation targets, (ii) adaptation, (iii) REDD+, (iv) financing climate change, and (v) capacity building for climate change management, the outcome of which was the Copenhagen Accord.

Since 2007, Nigeria has been participating in a series of climate change meetings, talks and

negotiations at the regional (Africa, G77+China, ECOWAS) and international levels. The country played a lead role in a series of meetings (Naivasha – Kenya; Abuja – Nigeria; Dakar – Sénégal; Bonn – Allemagne; AMCEN Meeting in Johannesburg – South Africa; Accra – Ghana; and Algiers - Algeria) that led to the development of the African Climate Platform towards Copenhagen. The country’s strategy was to influence the African position and align itself with G77 + China negotiating block in the series of negotiations that climaxed at the Copenhagen meeting.

As the COP15 meeting approached, Nigeria further made its position on the series of climate change negotiations clear in a well-formulated document that was presented at the Copenhagen meeting (see Federal Ministry of Environment 2009).

With specific reference to adaptation, Nigeria’s position to the Copenhagen meeting was to ensure that a climate change agreement result in the following specifics:

- Adequate and sustainable support to help meet immediate adaptation priorities in vulnerable countries (e.g. funding of NAPA activities).
- Support to country/regional efforts to improve climate data and information and to develop the capacity of African countries to monitor climate change and to enhance knowledge sharing.
- Support to vulnerable countries to integrate climate change adaptation at national, sectoral and project levels through climate proofing of development projects.
- Establishment of a more streamlined, innovative and transparent access to adaptation funds, taking into account the capacity peculiarities of developing nations to access them.
- Funding for adaptation should reflect liability for economic and social damages resulting from climate change, go beyond mainstreaming it into development, and addresses firmly the technological needs of developing countries to adapt to climate change.
- Specific agreement for additional contributions by developed countries towards new bilateral and multilateral funds to enhance international investment and financial flows to developing countries for economic diversification.
- Support to developing countries to improve the quality of models, in particular those that assess the adverse impacts on social and economic development as consequence of the responses to climate change, taken into account their legitimate priority development needs.

5.3.4 Informational

Public awareness is a main element of the informational opportunity structure for sustainable climate change adaptation measures in the country. There is a growing awareness of the need to act on climate change adaptation in Nigeria and some extremely promising developments with respect to political commitment and championing. These include the 2008 formation of the House Committee on Climate Change, which is acting to step-up advocacy broadly across the media, civil society, private sector and government; and the proactive stance adopted by a number of the States. Lagos State has set in place a Climate Change department and taken a

number of actions for awareness raising as well as concrete actions through the Lagos State Public Schools Climate Change Club. Niger State has convened a Climate Change Dialogue. In preparation for the country's participation in the series of Climate Change negotiations all the way to the Copenhagen Conference in December 2009, the SCCU organized a roundtable on 27 August 2009 with the objective of accelerating the engagement of all stakeholders nationwide on the consequences climate change and the imperative of adopting a low carbon development strategy for the country's sustainable development. The Unit also briefed the National Assembly and the Inter-Ministerial Committee on Climate Change. It has also organized a post-Copenhagen Climate Change Roundtable to deliberate on the implications of the Copenhagen Accord for Nigeria.

In general, despite above-mentioned initiatives, the communicative and informational capacities of the government in shaping the level of public awareness on climate change adaptation needs to be strengthened. More informational and communicative activities need to be implemented in a more coordinated manner with a well articulated communication and information strategy for climate change adaptation in the country. The current political will of the Nigerian leadership to boost academic knowledge and raise awareness on climate issues, in particular to pave the way for climate adaptation measures, needs to be further explored to to raise the level of climate change adaptation awareness in the country.

5.4 Climate actors

Adapting to climate change is a cross cutting issue that demands integration across the work programmes of several government departments and stakeholders, and across many sectors of industry, business and the community. This multi-stakeholder understanding and approach is the only way to successfully guide the process of identifying and implementing climate change adaptation response. Thus, a major determinant of Nigeria's adaptive capacity is the strength and competence of its numerous actual and potential climate actors as individuals and organization. They can be categorized as government, non-governmental and external actors, including private sector operators, research community (Universities and Research institutions), civil society, media and donors, among others.

5.4.1 Government actors

In Nigeria, climate policy and respond strategy is viewed mainly as an environmental problem. In this regard, the Federal Ministry of Environment⁶ is the most influential governmental actor in climate change policy-making and management. The Ministry's mandate include (i) securing a quality environment conducive for good health and well-being of fauna and flora; (ii) promoting sustainable use of natural resources; and (iii) restoring and maintaining the ecosystem, ecological process and preserve biodiversity.

⁶ The Ministry started in 1988 as the Federal Environmental Protection Agency. It became a full-fledged Federal Ministry of Environment in 1999, metamorphosed into the Federal Ministry of Environment, Housing and Urban Development in 2007, and reverted to Ministry of Environment in 2008, with specific agencies such as the National Oil Detection and Response Agency (NOSDRA) and National Environmental Standards and Regulations Enforcement Agency (NESREA) providing more focussed attention to some specific environmental problems for the Ministry.

The Federal Ministry of Environment created a Special Climate Change Unit (SCCU) in the Ministry to drive the national response to climate change at the national and international levels. SCCU is also Nigeria's Designated National Authority (DNA) for the Clean Development Mechanism. It works with a number of Ministries through the Inter-Ministerial Council on Climate Change. In 2009, it established a climate change desk in the Federal Ministry of Science and Technology, with a plan to expand the structure to other Ministries in the very near future. In general, climate and environmental policies at the national level are administered by the same Ministry. This ideally should make the national level governmental actors strong. A major constraint is the general perception by the public that SCCU has a limited capacity in technical, institutional and financial capacity to effectively and successfully drive the national response to climate change, unless the capacity is further strengthened or the Unit transformed into the proposed Climate Change Commission.

In addition to the SCCU, the Energy Commission of Nigeria has been an active governmental climate actor, but principally from mitigation point of view. The Nigerian Meteorological Agency and the Centre for Climate Change and Freshwater Resources, Federal University of Technology, Minna⁷ are active climate change actors at the national level. In addition, the Nigerian Institute for Oceanography and Marine Research (NIOMR) has been increasingly involved in enhancing Nigeria's adaptive capacity along the coastal and marine environment of the country. The National Emergency Management Authority (NEMA) has also shown some interest in climate change adaptation, while the focus of the Nigerian National Petroleum Corporation (NNPC) is in climate mitigation.

Other important potential governmental actors at the national level include the National Planning Commission (NPC), which is the primary coordinator of government programmes. In a recent meeting with the UNDP mission for the formulation of an adaptation programme for the country, NPC expressed commitment to acting on climate change and has begun to identify proactive adaptation initiatives. The NPC has also identified the need for a National Climate Change Policy, and for greatly improved coordination in order to create complementarity of actions.

At the State level, at least three state governments have become active climate actors. They are Delta and Lagos States. Delta State is a member of the Territorial Approach to Climate Change (TACC), which is a partnership of five UN agencies (UNDP, UNEP, UNITAR, UN-Habitat and UNCDF) with sub-national territories and their associations⁸. Delta State is the first in the country to formulate a "Climate Change Policy" aimed at mitigating and adapting to climate change.

⁷ The Centre for Climate Change and Freshwater Resources (CCCFR) is dedicated to training and research in climate change and its impact, with emphasis on freshwater resources management in Nigeria. A major element of its mandate is to conduct basic and applied research in climate change and freshwater resources management in Nigeria, including adaptation and mitigation studies for adverse effects of agricultural and water development projects etc.

⁸ TACC focuses on the level of governance covering territories below the national level (depending on the governance structure these include states, provinces, cities etc.), usually referred to as 'regions' or 'local governments'.

Lagos State has recognized that climate change is real and has put in place measures to tackle the problem. It organized the first International Summit on Climate Change in Nigeria in 2009 and is planning hold the Second Regional Summit on Climate Change in May 2010. It has undertaken a number of awareness raising initiatives, the most prominent being *The school Advocacy* programme whereby students of primary and post primary institutions in the city of Lagos are educated on the issue of Climate Change and environmental management by specially trained instructors. The programme has succeeded in establishing climate change clubs in 172 primary schools and 348 post primary institutions in the state with 105 instructors engaged to educate them on all aspects of environmental matters especially as they relate to climate change.

With support from the UNDP, Niger State was the first State in Nigeria to convene a Climate Change Dialogue in 2009, and has harmonised legislation and restructured institutions to promote sustainable development and responding to climate change. It is expected that more States (e.g. Sokoto, Anambra and Cross Rivers) will follow Niger State's example. The question of course is whether interest shown by these states is as a result of genuine state priority development interest or because of UNDP support?

5.4.2 Non-Governmental Actors

Besides governmental actors, non-governmental organizations have great potential to play a larger role in Nigeria's adaptation response to climate change. There are many non-governmental actors from different sectors (e. g., science, industry, NGOs, media, donors). Because they are not properly coordinated, it is not possible to either discuss them in unison or capture all the concerned in this report. We have only selected a few active ones to show they are playing some role in the climate change management regime, but that there is a lot of room for improvement for Nigeria to be able to build a climate-resilient society, particularly at the community level.

Among the active NGO climate change actors, Nigeria Climate Action Network (NigeriaCAN) stands out very well as perhaps the most active, particularly in the area of advocacy. Another active NGO climate actor in Nigeria, particularly in the area of knowledge and research, is the Nigerian Environmental Study Action Team (NEST).

There are other many registered NGO climate actors that are working in different aspects of adaptation. Prominent among these are the Climate Change Network (CCN) Nigeria, Youth Organization for Climate Change, Nigeria Conservation Foundation (NCF); Women Farmers Advancement Network, Kano Nigeria (WOFAN); Women Environment Programme (WEP); African Radion Drama Association (ARDA) Nigeria; Coalitions for Change (C4C); Centre for Education and Leadership Development (CELDEV): and Nigeria Model United Nations Society (NigMUNS). A summary of its climate-related activities of some of the NGOs is given in Annex III⁹.

In recent years the media has taken an increasing interest in the environmental situation, and environmental reports, including climate change and climate-related reports, are now an

⁹ Only a few selected ones are mentioned in the report, as time and resource constraints make it difficult to capture the numerous NGOs that claim to be actively involved in climate change activities in Nigeria.

important part of media coverage. SCCU uses the media to support official climate change initiatives and events.

Even though these NGOs have a certain climate capacity, their influence appears limited. At present it is the think tanks close to the government that appear to be playing the most important role in national adaptation response. In general, NGOs in Nigeria are seen as relatively weak actors whose political space is constrained due to lack of adequate funds and human resources. Moreover, their ability to influence the state is seen as limited. With enhanced capacity, they would be capable of playing a more active role in climate change adaptation as demonstrated by NigeriaCAN during the preparation for the Copenhagen Climate Change Summit. With its insistence on the imperative for government to open up the climate space in the country, Nigeria ended up having over 300 delegates to the Copenhagen Summit.

5.4.3 Private sector operators

The study has established that there is not much collaboration between the public and private sectors when it comes to issues climate change adaptation in Nigeria. Rather, public-private partnership has been more in climate change mitigation, particularly as it relates to the CDM for which Nigeria has been able to get 3 projects approved (Table 1).

Table 1: CDMs IN INGERIA

Total Projects: 3						
Registered	Title	Host Parties	Other Parties	Methodology *	Reductions **	Ref
09 Nov 06	Recovery of associated gas that would otherwise be flared at Kwale oil-gas processing plant, Nigeria	Nigeria	Italy	AM0009 ver. 2	1496934	0553
01 Feb 09	Pan Ocean Gas Utilization Project	Nigeria	Norway	AM0009 ver. 2	2626735	2029
12 Oct 09	Efficient Fuel Wood Stoves for Nigeria	Nigeria	Germany	AMS-II.G.	31309	2711

5.4.4 External actors

Development partners have made a number of interventions to support climate adaptation initiatives in Nigeria. With support from Japan, UNDP, UNIDO and UNICEF are about to

finalize a project of support on *Promoting an integrated approach to adaptation in Nigeria through building the governance system, empowering children as change agents and demonstrating adaptation benefits in the agricultural sector*. The project will promote an integrated approach to adaptation to climate change through building the governance system, empowering children as change agents and demonstrating adaptation benefits in the agricultural sector.

The British High Commission, with ICED and Christian Aid, is currently supporting advocacy programmes to raise awareness in the National Assembly, through the Nigeria Climate Action Network. A working document on adaptation strategies of action for Nigeria has been developed by the SCCU and the Heinrich Böll Stiftung (HBS), which focuses on 11 different sectors in which adaptation will be crucial in Nigeria, identifies interventions and provides a preliminary ranking of these. CIDA is supporting the BNRCC programme. William J. Clinton Climate Change initiative is also supporting Nigeria's adaptation in some ways. In addition, Nigeria is benefiting from the implementation of the African Adaptation Programme (AAP). AAP is funded by the Japanese Government I about 20 African countries. It will be jointly implemented in Nigeria by the UNDP, UNICEF and UNIDO. Annex IV gives a profile of some international bilateral and research institutions and international NGOs in the country.

Despite all these initiatives, additional assessment of adaptation options in Nigeria is required in order to be able to mobilize and prioritize resources, as well as fill basic information and research gaps, so that the strategic approach to adaptation is soundly evidence-based. Coupled with the absence of a national climate change policy and adaptation strategy, the uncoordinated nature of the various actors indicates an overall weak climate change governance in Nigeria. The major consequence of the country's limited coherent policy/strategic approach to climate change adaptation is its increasing adaptation is Nigeria's increasing vulnerability as witnessed in the recent floods (see Box 1).

BOX 1

CONSEQUENCE OF WEAK CLIMATE CHANGE GOVERNANCE:

FLOODS KILL 3, DISPLACE THOUSANDS IN NORTHERN NIGERIA (AGENCE FRANCE-PRESSE) – SEPTEMBER 1, 2010

Heavy rains in recent weeks have killed at least three people and displaced thousands in northern Nigeria where entire villages have been submerged and farms destroyed, officials said Wednesday.

Katsina: "We lost a whole village and its crop fields to the flood," said Hassan Suleiman, a director in Katsina state emergency relief agency.... At least three people were killed Monday (August 30) and over 2,000 others made homeless from flooding in Katsina state, officials said. The destruction of the village resulted in two deaths and 400 displaced. Another 1,700 were displaced in the town of Dutsin-Ma when a dam broke and flooded more than 200 homes, said Suleiman.

Jigawa: In neighbouring Jigawa State, flooding submerged 25 villages, displacing 7,000 people and washing away 3,000 hectares of crops in the last two weeks, Umar Kyari, the state governor's spokesman, told AFP. A river burst its banks due to torrential rains, inundating the 25 villages along its banks, Kyari said.

Kano: The flooding swept away more than 2,000 farms and destroyed crops in neighbouring Kano state's Gabasawa district, according to Sabo Nanono, who heads Kano state's farmers' union. Local officials said that more than 3,000 people were displaced two weeks ago when two villages in Kano were hit by flooding.

Zamfara: Hundreds were also displaced while more than 2,000 farms were destroyed three weeks ago following flooding in Gummi town in northwestern Zamfara State, residents said.

Sokoto: Heavy rainfall in September 2010, led to the washing away of the bridge linking the Usmanu Dan Fodio University, Sokoto and Sokoto township with thousands of people living around the University Campus totally isolated as the other bridge on Ilela road that could be used was already under reconstruction. As a result of the collapse of the bridge on the University Campus, the linkage road between Nigeria and Niger from Sokoto was totally cut off. But the rainy season is still continuing, so victim numbers may rise even further (*Mohammed Bello in Sokoto, personal communication*)

6. Case study of Ghana – policy/strategic approach¹⁰

This section of the report emphasizes the policy and institutional aspects of climate change adaptation capacity as it relates to Ghana. The purpose is to point out some contrasting approaches between Nigeria and Ghana and also draw out some lessons that can support Nigeria in its current efforts to enhance her adaptive capacity to climate change risks. It draws heavily on available information in the public domain.

6.1 Policy

Like Nigeria, the Ghanaian economy depends heavily on the agriculture, forestry, and fishery sectors, all of which are highly sensitive to projected climatic fluctuations. The adverse impacts associated with climate change will most likely hit poor rural communities the hardest, whose livelihood are most closely related to these climate vulnerable sectors.

Unlike Nigeria, however, Ghana appears to have had a structured approach to enhancing its climate change adaptive capacity. This is because it participated in the Netherlands' Climate Assistance Programme (NCAP) between 2003 and 2006. The implementation of NCAP provide Ghana a golden opportunity to embark on a serious attempt to mainstream climate change into its Poverty Reduction Strategy (PRS), which was a critical starting point for the Ghana NCAP project.

The NCAP funded project in Ghana was implemented over the course of three years in two separate phases, with the aim of strengthening national capacity to respond to the challenges of climate change by formulating climate change policies that are consistent with the GPRS. It also facilitated the mainstreaming of these policies into district as well as national development plans.

¹⁰ This is a very preliminary assessment based on telephone conversation and scoping for information on the internet. It will be improved as soon as the consultant is able to go to Ghana for stakeholders consultation.

The implementation of NCAP enabled the country to undertake activities on sectoral vulnerability and adaptation assessments in its first phase. These studies explored vulnerability in relation to a set of climate change scenarios (changes in temperature, precipitation etc.), and proposed adaptation strategies to build resilience against threats associated with climatic variability and change. The sectors covered included human health, fisheries, land management and agriculture. Such detailed analyses are still missing in Nigeria. In the final phase of its implementation, NCAP identified 10 adaptation priorities that included: (i) research and development; (ii) environmental sanitation; (iii) awareness creation; (iv) improved land use practices; (v) early warning systems; (vi) alternative livelihoods; (vii) water resources management; extension services; (viii) extension services; (ix) improved farming technologies; and (x) fisheries resources management.

Overall, the implementation of NCAP helped to strengthen Ghana's national capacity regarding the methods and tools for prioritization of adaptation options, as well as integrating stakeholder contributions regarding adaptation strategies/options. It helped the country to explore the linkages between poverty alleviation, climate change, and adaptation responses towards developing a national approach to mainstream climate change concerns into ongoing development efforts.

The structured approach to adaptation that Ghana benefited from the implementation of NCAP enabled the country to develop a National Climate Change Adaptation Strategy (NCCAS) document by January 2010. The strategy is designed to enable Ghana manage risks, adjust development, including economic, environmental and socio-cultural activities to reduce vulnerability of the Ghana economy, population and ecosystems to the impacts of climate change in order to provide certainty to national development aspirations and growth. It is a long-term (2010 – 2020) strategy document designed to implement the ten adaptation priorities that were identified under NCAP.

Ghana has started to benefit from putting in place evidence-based studies from NCAP and the development of development of NCCAS. It is about to benefit from a UNDP/GEF-assisted US\$5.64 million (US\$1.89 million from GEF and US\$3.75 million co-financing) project on *Integrating Climate Change into the Management of Priority Health¹¹ Risks* from the Special Climate Change Fund.

In addition to implementing NCAP and formulating NCCAS, Ghana has as far back as 2003 conducted its Climate Change Technology Needs Assessment, and it is about finalizing its report on the Financial NEEDS Assessment for submission to the UNFCCC. The National Climate Change Committee in Ghana has also been given the task of formulating a National Climate Change Policy for Ghana by the Minister of Environment, Science and Technology.

6.2 Institutional

The Ghana Environment Protection Agency (GEPA) is the designated climate change national authority, with Mr. William Agyemang-Bonsu as the focal point. Mr. Bonsu was an effective co-chair for the adaptation negotiations up to the Copenhagen Climate Change

¹¹ Health is one of the 10 adaptation priorities identified in NCAP.

Conference. GEPA is now an Agency of the newly created Ministry of Environment, Science and Technology. Supporting the Climate Change Designated Authority is a National Climate Change Committee, made up of representatives of relevant Ministries, private sector operators and NGOs.

6.3 Climate actors

Through a series of workshops, NCAP enabled Ghana to establish a network of climate actors, including parliamentarians and NGOs, who participated in the prioritization of adaptation options for Ghana. Some of the NGO climate actors include Friends of the Earth, Clean Climate Heritage, Green Bongo for Sustainable Environment for Tree Planting, and Action Aid Ghana. Universities, research institutions (e.g. University of Legon and University of Kumasi) and academic organizations are also closely related to government agencies in Ghana. The Kwame Nkrumah University of Science and Technology worked with Ghana EA and other institutions to implement a project on *Capacity Development and Adaptation to Climate Change On Human Health Vulnerability in* between 2007 and 2008. Ghana EPA has also been using the media effectively to advocate its climate change activities, particularly during the numerous stakeholders' consultations that accompanied NCAP implementation and the formulation of the NCCAS.

Bi- and multilateral donors also play a key role in addressing the climate change adaptation problem in Ghana. UNDP, UNEP and the World Bank are actively involved in supporting national climate change adaptation initiatives.

6.4 Comparative assessment

A preliminary comparison of the adaptation capacities between Nigeria and Ghana indicates that a programmatic approach is imperative to drive national adaptation process for mainstreaming into national development and developing evidence-based actions that can reduce the vulnerability and enhance the resilience of the people to the impacts of climate change.

Comparatively speaking, Ghana has obviously performed better than Nigeria in terms of having a National Climate Change Adaptation Strategy and detailed vulnerability assessment reports on (i) land management, agriculture (cocoa and root tubers), water (fisheries), health and gender. These studies are being used to determine necessary policy changes needed in agriculture, water, forestry and housing, among others, for effective adaptation to climate change. In a similar manner, the reports of the Technology Needs Assessment and Financial NEEDS provide Ghana evidence-based information for good policy decision-making. All these are still missing in Nigeria, although the country's climate change focal point keeps on indicating that they are at different levels of development.

Ghana was able to achieve quite a lot of the above-mentioned initiatives as a result of the programmatic and structured approach that the implementation of NCAP provided. Nigeria would need to develop a well-formulated climate change adaptation response strategy for it to put in place a number of initiatives that should better prepare the country for the "unavoidable" and potentially large impacts of climate change on the country.

7. Enhancing Nigeria's capacity for climate change adaptation

Responding to the threat of climate change will also require concerted adaptation action on an unprecedented scale. The poor will be severely affected because they are the least able to adapt. Systematic action will be required across all levels of development planning and implementation in Nigeria (national, state, local) if development is to be sustainable and not even reversed. This study shows that Nigeria faces a number of policy-related, institutional and informational challenges. They include:

- limited and fragmented approach to climate adaptation strategies, policies and initiatives. Policy coordination, in particular, remains a major challenge for Nigeria's climate policy;
- weak institutional capacities, and insufficiently developed relationships, policies and practices to assess and manage climate change risks, and formulate and implement efficient and effective adaptation solutions to the complex multi-sectoral effects of climate change;
- limited knowledge of the most appropriate adaptation policies and measures hinders countries from preparing themselves with the necessary institutional capacities to support climate risk management;
- limited financing for sustained policy, institutional and technical capacities required for scaled-up adaptation initiatives;

- limited scientific knowledge and policy research that is a constraint to testing and demonstrating possible solutions and developing the requisite technological breakthroughs to build a resilient and less vulnerable society; and
- limited information exchange with other countries about their experiences with different approaches to adaptation.

7.1 The issues in the Nigeria-Ghana comparative context

The above mentioned challenges can be captured by the following issues:

- (i) **Limited understanding of the severity of the country's vulnerability to climate change and variability.** Given the country's vulnerability to its impacts, climate change is now the most pressing development concern in Nigeria. In the recent past, the country has experienced a rise in sea level, increased temperatures, enhanced rainfall and runoff, potentially reduced dry season precipitation, and an increase in the frequency and intensity of extreme weather events and storm surges. These harmful climate change impacts are due to the country's vulnerable geophysical location, low deltaic floodplain, hydrological influence by erratic seasonal rainfall, and changes in regional water flow patterns. Further, due to climate change, it is predicted that average sea levels may rise by 0.1 m and 0.2 m by 2020 and 2050 respectively, and a temperature increase of 0.4 to 1°C over the same time periods. Sea level rise of 1m could result in loss of 75% of the Niger Delta. The poor

that live and depend disproportionately on the resources of the coastal and marine environment would be the most vulnerable to these impacts.

Despite this common knowledge and **unlike Ghana**, Nigeria has not undertaken a detailed vulnerability assessment to effectively determine its adaptation response. Most of the figures quoted in the climate change literature in Nigeria remain somewhat conjectural with limited baseline information. Adaptation capacity of a system depends on natural, socio-economic and environmental properties of the system, and severe impacts of climate change on systems with weak adaptation capacity results in high vulnerability. In order to develop and implement appropriate response strategies, it is very critical for Nigeria to understand how climate change and sea level rise will affect and impact on our coastal ecosystems, marine resources, agricultural developments, human health, water resources, population, and the national economy at large. Vulnerability assessment for each sector, region, and community at both present and future must be carried out, using up-to-date methodologies. It will provide the means by which critical adaptation options for the country can be identified.

- (ii) **Integrating Climate Change and Development:** Climate change also threatens the significant achievements Nigeria has made in the last 20 years in increasing incomes and reducing poverty, including those related to the Millennium Development Goals on eliminating poverty and hunger; ensuring food, health security, and human rights; and promoting environmental sustainability. Additionally, in association with other socioeconomic, environmental, and political factors in Nigeria, climate change is expected to amplify the country's existing environmental stresses, contributing further to food insecurity and conflict over natural resources. Key challenges to tackling climate change in Nigeria will be to (i) ensure food security and comprehensive disaster management, (ii) address water scarcity and health and energy insecurity, (iii) environmental hazards (soil erosion and desertification) control and management, and (iv) deal with forced migration and overall environmental degradation. This requires that climate change is properly integrated and mainstreamed into national development process and plans such as Vision 2020 and the 5th National Development Plan that is under preparation. However, these challenges are further aggravated by population pressures, lack of funds for appropriate adaptation measures, inadequate policy frameworks, and limited human and financial resources.

Ghana, on the other hand, has used the implementation of NCAP to embark on a serious attempt to mainstream climate change into its Poverty Reduction Strategy (PRS), which was a critical starting point for the Ghana NCAP project. In addition, it is about to benefit from a UNDP/GEF-assisted US\$5.64 million (US\$1.89 million from GEF and US\$3.75 million co-financing) project on *Integrating Climate Change into the Management of Priority Health Risks* from the Special Climate Change Fund. Other sectors may soon benefit from the approach.

- (iii) **Policy Framework and Adaptation Programme:** Nigeria needs to put in place (i) National Climate Change Policy; (ii) National Climate Change Adaptation Strategy and Action Programme (NCCASAP) which would identify priority activities to combat

climate change impacts in the country, including general awareness raising, technical capacity building, and implementation of projects in vulnerable regions with a special focus on agriculture, health and water resources, among others and lead to the development of a costed long-term (at least 10-year period) programme to build capacity and resilience within the country to meet climate change challenges over the next few decades. The programme should focus on main development thematic areas such as (i) food security, social protection, and health; (ii) comprehensive disaster management; (iii) infrastructural development; (iv) research and knowledge management; (v) mitigation and low-carbon development; and (vi) capacity building and institutional strengthening.

Ghana, again, is ahead of Nigeria in the above regard. It has held the final stakeholders' workshop to validate its National Climate Change Adaptation Strategy (NCCAS) document in January 2010. In other words, the NCCAS document has by now become a national strategic approach to addressing the issues of climatic vulnerability and adaptation in the country. Moreover, Ghana is also in the process of finalizing its National Policy document on Climate change, a process Nigeria is yet to embark upon.

- (iv) **Funding:** To focus mainly on adaptation measures, the Government of Nigeria needs to put in place adequate funding. A major concern by the SCCU is the lack of annual capital budget that should enable it to undertake critical climate change initiatives to enhance the adaptive capacity of the country. There is an on-going initiative to establish a National Strategic Climate Change Trust Fund in the country to pool funds from government, private sector and development partners to implement a long-term strategy to mitigate the adverse effects of climate change in Nigeria. The country needs to be supported to realize this initiative to enable Nigeria to meet the high cost of climate change adaptation.

Nigeria may be moving ahead in the area of having a national trust fund for climate change, but **Ghana** again has completed its UNFCCC NEEDS assessment that could put her again in the forefront of having a nationally sustainable fund for the management of climate change.

- (v) **Capacity Building and Institutional Strengthening.** The two countries (**Nigeria and Ghana**) need sustainable initiatives to enhance their institutional capacity for climate change vulnerability reduction and enhancement of national resilience to climate change impacts. In the case of Nigeria, the implementation of realistic adaptation response strategies will involve significant strengthening of the coordination and facilitation capacity of the SCCU in the Federal Ministry of Environment, as well as building capacities at state and local government levels

7.2 Possible areas for HBS intervention Nigeria

This report has so far shown that Nigeria's response to climate change in general, and adaptation in particular, has been very limited. There is neither a climate change policy nor a well-formulated response strategy. The effectiveness of environmental and other sectoral policies are weak and their potentials to support adaptation to climate remain largely under-utilized by virtue

of their poor implementation and limited inter-sectoral linkages. In addition to poor policy framework and lack of focused strategy to respond to climate change in the country, there is also the issue of very weak institutional framework to tackle the problem. Apart from the SCCU in the Federal Ministry of Environment and a few institutions at the national level (e.g. NIMET and the Climate Centre in Minna), there is no formal institutional structure at state and local government levels to address climate change. Even then, the capacity of SCCU to drive and coordinate national climate change response is weak. There are very few people with proven competencies in the Unit and facilities remain inadequate. Furthermore, the national institutions, including the SCCU, are not properly funded. It was openly acknowledged by the SCCU that the UNIT has no capital vote in the yet to be implemented 2010 national budget. Thus, the Unit is heavily dependent on bi- and multi-lateral donor support for its activities, including putting in place a National Adaptation Strategy and Action Plan.

The weak national approach to climate change response is unlike that adapted by Nigeria to controlling HIV/AIDS in the country, in which the national response is through a three-tier system of administration. The National Action Committee on AIDS (NACA)¹² is equivalent to the SCCU for climate change, but NACA reports directly to the President of the Federal Republic of Nigeria. At the state level, this structure is replicated as the State Action Committee on AIDS (SACA). It is situated in the Office of the Governor of the state. At the local government level, we have the Local Government Action Committee on AIDS (LACA). It is situated in the Office of the Local Government Chairman. This structure provides the policy direction and oversight of the response at these various levels. This is to enable them have the political authority to coordinate the multi-sectoral response to AIDS.

But climate change is like AIDS to our development. It is a major threat to our sustainable development, as many of socio-economic sectors are very vulnerable. It could even reverse the gains made so far in our national effort to achieve the Millennium Development Goals (MDGs). Adaptation is, therefore, not only necessary, but also imperative to reduce the vulnerability and strengthen the resilience of government, people, economy, ecosystems, infrastructure and other sectors in different regions of the country to potential impacts of climate change.

Enhancing the adaptation capacity of Nigeria requires that climate change concerns are given a high national priority and attention. It also requires that climate change impacts and Nigeria's vulnerability are well assessed and realistic response strategies are put in place. In addition, the country must develop and implement policies and regulations that will address the problem in an inter-sectoral manner. There must be a strong coordination between sectors. Effective oversight of policy implementation should be supported by strong and functional structures at national, state and local levels that are well financed and have significant number of high quality staff. All these require critical institutional changes to ensure that climate change issues are given appropriate attention of the highest authority at national, state and local levels of government as is the case with HIV/AIDS pandemic. There must also be adequate resources to finance adaptation response.

¹² NACA is made up of members from Public and Private sectors, parastatals and agencies, civil society and faith-based groups.

Regarding the imperative for institutional change to enhance national response to climate change, the ongoing initiative to transform the SCCU into a Commission for Climate Change provides a good opportunity to put the national climate change management institution within at least the level of the Office of the Vice President to attract the desired attention and support that will make it more functional than at present. Formal climate change response institutions are also imperative at the state and local government level. States' Ministries of Environment or State Environmental Protection Agencies and Local Government Environment focal points could be utilized as climate change response institutions at their respective levels. These are challenges that are beyond the resources and existing capacity of Nigeria. It requires support from national and international sources.

Overall, it is now clear that for Nigeria to be adequately prepared for climate change adaptation, it must have in place a number of elements that will enable it to have a coherent governance system and empower the various stakeholders, including the youth and the vulnerable, as well as gender considerations. As indicated in the draft African Adaptation Programme (AAP) that is about to be implemented, Nigeria needs to have in place the following:

- Dynamic, long-term planning mechanisms to cope with the inherent uncertainties of climate change introduced.
- Gender-sensitive leadership and institutional frameworks to manage climate change risks and opportunities in an integrated manner at the local and national levels strengthened.
- Climate-resilient policies and measures implemented in priority sectors implemented.
- Financing options to meet national adaptation costs expanded at the local, national, sub-regional and regional levels.
- Knowledge on adjusting national development processes to fully incorporate climate change risks and opportunities generated and shared across all levels.

Looking at the above-mentioned challenges for Nigeria to respond adequately to climate change adaptation, a good entry point for HBS is to provide technical support to enable Nigeria to:

1. Undertake a detailed and methodology-proven sectoral analysis (e.g. coastal and marine environment, agriculture, water resources, land management, human health, gender etc.) of Nigeria's vulnerability to climate change and propose realistic adaptation response strategies and initiatives (programmes and projects at all levels, including community-based activities).
2. Enhance its institutional response capacity by providing support to the development and implementation of a capacity building project or initiative for a coordinated institutional response to climate change that will have functional structures at the national, state and local government level, using exiting relevant institutions and agencies (i.e. develop and implement a capacity building initiative for the SCCU or the proposed Climate Change Commission to function in a similar manner to NACA).
3. Successfully mainstream or integrate climate change adaptation into the Vision 2020 and other National Development planning documents.

4. Increase awareness and capacity among Nigerian politicians, policymakers and other key stakeholders to address climate change adaptation within Nigeria's development process.

Using its comparative NGO advantage of extensive networking, HBS should partner with bi-multilateral organizations to support some of the above-mentioned strategic initiatives that can help Nigeria to get its acts together in its national efforts to enhance its climate change adaptive capacity.

8. Conclusion

Climate change presents an urgent challenge to the well-being of the people of Nigeria, as it is no longer possible to avoid some degree of global warming and climate change. Climate action regarding adaptation is therefore increasingly important. Adaptation is understood to include efforts to adjust to ongoing and potential effects of climate change. Building up resilience to increasing climate variability is the most significant climate challenge facing the country.

Given the inherent costs involved, adaptation should be pursued not as an end in itself, but as a means to meet the development objectives of Nigeria. The country needs to factor climate risks into its development planning and consider the range of interventions that will increase its resilience to climate change. In doing so,

Nigeria must address a number of capacity limitations that have been pointed out in this report. Significant effort needs to be made to develop further capacities designed to strengthen Nigeria's climate change adaptation governance. The Heinrich Boll Stiftung (HBS) is a valuable international partner that can help Nigeria to build capacity in relevant government agencies at all levels (national, state, local) to strengthen the country's capacity to develop and implement adaptation response strategies and plans that would her reduce her vulnerability to the impacts of climate change. HBS would need to partner with other bilateral and multilateral development agencies and organizations in this task in order to have meaningful impact in the country.

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