13.0 Nigeria

ACCCA	Advancing Capacity to Support Climate Change Adaptation
BNRCC	Building Nigeria's Response to Climate Change Project
CCAA	Climate Change Adaptation in Africa program
CIDA	Canadian International Development Agency
DEFRA	Department for Environment, Food and Rural Affairs (UK)
DFID	Department for International Development (UK)
EC	European Commission
ENDA-TM	Environment and Development Action in the Third World
ETC	European Topic Center
FAO	Food and Agriculture Organization
GDP	Gross Domestic Product
IDRC	International Development Research Centre
MEFRN	Ministry of the Environment of the Federal Republic of Nigeria
NCAP	Netherlands Climate Assistance Programme
NEST	Nigeria Environmental Study/Action Team
SEI	Stockholm Environment Institute
START	Global Change System for analysis, research and training
UNDP	United Nations Development Programme
UNEP	United Nations Environment Programme
UNFCCC	United Nations Framework Convention on Climate Change
UNITAR	United Nations Institute for Training and Research

Occupying around 14 per cent of the land area of West Africa, Nigeria is home to approximately 152.2 million people (in 2010), making it the most populous country in all of Africa (CIA, 2011). The Niger Delta, one of the world's largest river deltas, is the site of Nigeria's large petroleum industry, which provides about 13 per cent of the country's GDP. This industry, along with natural gas, coal and oil sands resources and a growing telecommunications industry, has helped Nigeria to become one of the most developed countries in Africa. Still, agriculture remains a critical component of Nigeria's economy, representing an annual average of 38.8 per cent of GDP between 1993 and

1997. Around 60 per cent of the labor force is employed in this sector, and more than 90 per cent of agricultural production comes from rural-based, small-scale farming. Root crops are dominant in the south, while in the main crops in the north are grains. Livestock production is also of importance in the north.

A. Adaptation Needs and Priorities

Nigeria has a diverse climate, ranging from an equatorial climate in the south to a tropical climate in the center and being quite arid in the north (CIA, 2011). Two seasons dominate—wet and dry—with the wet season lasting from 9 to 12 months in the southern coastal areas, but only three to four months in northeast Nigeria. Temperatures today are high throughout the country, with an average of 27ºC; maximum average temperatures in some parts of the country reach up to 41ºC (MEFRN, 2003). In both its coastal and northern Sahel regions, recent studies have revealed declining trends in rainfall, which is corroborated by an observed trend towards aridity in Sub-Saharan West Africa (MEFRN, 2003).

Climate change projections suggest that minimum and maximum temperatures will rise in the order of 7ºC or more in some parts of the country. The current trend of declining rainfall is expected to be put on hold or be reversed as the century processes. However, this potential increase in rainfall may not offset the additional water need created by higher temperatures (MEFRN, 2003). The most severe impacts are projected to occur in the Sudan savanna and Sahel savanna regions of northern Nigeria, which are already under serious water stresses. Sea level rise is also very likely to threaten the country's coastal zone and low-lying islands, which are currently plagued with floods and erosion. With a projected sea level rise of about 0.5 meters, between 27 and 53 million people may need to be relocated due to climatic variations and inundation of land (MEFRN, 2003). These changes in climate factors are expected to alter the boundaries of Nigeria's major ecological zones, flora and fauna composition, reduce productivity, and increase soil erosion, flooding, desertification and salt-water intrusion (MEFRN, 2003).

All of these projected impacts, including temperature increases and sea level rise, are expected to increase Nigeria's vulnerability and undermine its adaptive capacity. According to Nigeria's First National Communication on Climate Change released in 2003, the main national resources identified as having high potential susceptibility to climate change are: agricultural ecosystems (crop production, livestock and fisheries), water resources and coastal resources. Other key socio-economic sectors at risk include health, land-use change and forestry, energy, industry and transport (MEFRN, 2003). Specifically, Nigeria has identified the needs and proposed adaptation actions presented in Table 1 for vulnerable sectors where adaptation is a priority.

Table 1: Priority Adaptation Needs and Actions in Nigeria (MEFRN, 2003)

Sector	Adaptation Needs	Adaptation Actions
Agriculture	• Improvement of local agricultural crop varieties that are well acclimated and drought and pest resistant. • Development and implementation of appropriate hydro and agro-technical systems for accumulation and efficient use of rainfall. • Introduction of new irrigation schemes to dry land management to improve water use efficiency. • Improved use of fertilizers. • Creation of socio-economic conditions for profitable agricultural activities. • Implementation of agricultural systems adequate to protect the soil from erosion.	• Alteration of planting calendar and crop choices. • Increased irrigation and number of watering points. • Use of terraces, ridges, and minimum tillage. • Careful use of agrochemicals and supplementary feeding. • Preference of polyculture over monoculture. • Reduction of stocking rates or livestock density. • Restoration and expansion of grazing areas. • Provision of effective extension services.
Freshwater Resources	• Increase of water supply capacity through construction of new structures. • Promotion of water recycling and reuse. • Development of groundwater supplies. • Protection of watersheds and reservoir sites through the establishment of intensive vegetation coverage.	• Construction of more dams and other reservoirs. • Intensification of roof-catch and other rainfall harvesting strategies. • Desiltation of reservoirs. • Encouragement of water recycling and reuse. • Protection of watersheds, aquifers, and reservoir sites.
Human Health	• Strengthening of the health care delivery system. • Sustained public awareness on health issues. • Improvement of public sanitation and immunization coverage.	• Relentless attack on disease vector populations. • Improved public sanitation and water supply. • Enhanced immunization coverage and general healthcare delivery. • Adequate response to disasters. • Reduced population growth rate. • Sustained public enlightenment on health issues.
Coastal Zone	• Beach nourishment (beach fill), dune restoration and creation, wetland restoration and creation and reforestation. • Limiting development in areas likely to be flooded.	

B. National Level Policies and Strategic Documents

At present, Nigeria's strategy for addressing the impacts of climate change is captured in its First National Communication on Climate Change. However, Nigeria has initiated the development of a National Adaptation Strategy and Plan of Action, which is being prepared as part of the Building Nigeria's Response to Climate Change Project (BNRCC).[251] As well, in October 2010, the Nigerian Parliament agreed

[251] Personal correspondence, John van Mossel, Building Nigeria's Response to Climate Change, 16 November 2010.

to set up a climate change Commission under the Presidency that will be the purview of 11 Ministries (Ogala, 2010).[252] Plans also are reportedly underway to establish the Nigeria Strategic Climate Change Trust Fund that will be sponsored by the Special Climate Change Unit of the Nigerian Ministry of the Environment and the United Nations Development Programme (UNDP). Through this Fund, financial contributions will be gathered from all stakeholders, including the private sector, to help ensure sustainable financing for adaptation, mitigation, research and information, and the adoption of appropriate technology (Haruna, 2010).

Table 2: Key Government Policies and Reports reflecting Adaptation Needs, Priorities and Planned Actions

Name of Policy Action		Government Division Responsible	Status	Summary description
1.	First National Communication on Climate Change	The Ministry of Environment of the Federal Republic of Nigeria	Released in 2003	This document describes the steps Nigeria is taking and envisages undertaking to implement the UNFCCC. It underlines key vulnerabilities (agriculture/food security, water resources, public health, fisheries, terrestrial ecosystems, tourism and energy) as well as adaptation needs.

C. Current Adaptation Action

A moderate number of adaptation focused projects are currently underway in Nigeria, relative to other countries in West Africa. Many of these projects focus on increasing awareness of the potential impacts of climate change, understanding potential impacts and supporting the government in building its capacity to address climate change impacts. Several projects address concerns in the agriculture sector; others focus on ecosystem conservation, freshwater, gender and governance. Only one project identified to date is working at the community level to reduce vulnerability to impacts in Nigeria's coastal areas.

Table 3: Current Adaptation Actions in Nigeria

Name		Objectives	Funder(s)	Implementing Agency(s)	Type of project	Duration	Priority Sector(s)	Geographic focus (if any)
National Action								
1.	Strengthening the Capacity of Smallholder Farmers to Adapt to Climate Change through Radio Drama[253]	The objective is to support the production and test of a 26-episode radio drama featuring climate adaptation content.	DFID and IDRC through the CCAA program	UNEP	Knowledge communication	Unknown	Agriculture	National

[252] Information also confirmed through personal correspondence, John van Mossel, Building Nigeria's Response to Climate Change, 16 November 2010.
[253] IDRC,www.idrc.org/ccaa

Name		Objectives	Funder(s)	Implementing Agency(s)	Type of project	Duration	Priority Sector(s)	Geographic focus (if any)
2.	Assistance to Nigeria in Assessing Adaptation Requirements in the Agriculture Sector[254]	The objective is to promote the development and dissemination of methodologies and tools for climate change impact assessment and adaptation planning; to enhance the interface between the agricultural, meteorological and socio-economic communities, farmers, pastoralists and other stakeholders.	Unknown	FAO	Capacity building; Assessment	2007 – 2010	Agriculture	National
3.	The Building Nigeria's Response to Climate Change Project[255]	The project purpose is to build Nigerian capacity to meet international commitments and adapt to climate change through improved governance promoting gender equality, poverty reduction and more sustainable natural resources management.	CIDA	CUSO; Marbek Resource Consultants; Nigeria Environmental Study/Action Team (NEST)	Capacity building	2007 – 2012	Government; Gender	National
Participation in Regional and Global Projects								
4.	Climate Proofing Energy Systems: Vulnerability-Adaptation-Resilience[256]	The objective is to develop a methodology and indicators in order to evaluate the vulnerability of energy systems to climate change and to adapt to climate change	France; GIZ; BMZ; IUCN; and La Francophonie	HELIO International	Research; Assessment	2007 - 2009	Energy	African: Benin; Burkina Faso; Cameroon; DRC; Kenya; Mali; Nigeria; Senegal; Tanzania; Uganda
			In Nigeria: The report formulates recommendations that include: enhance national energy system structure and institute immediate legislative and executive action; move from single revenue source for national development; reduce the dominance of a single energy source for supply of primary fuels and electricity generation; reduce supply and demand short-falls for refined petroleum products and electricity by improving infrastructure and maintenance capacity; address electricity network inadequacy and reliability; and develop					

[254] http://unfccc.int/files/adaptation/sbsta_agenda_item_adaptation/application/txt/fao_pledge_6.pdf
[255] http://www.nigeriaclimatechange.org/projectinformation.php
[256] http://www.helio-international.org/projects/VAR09.cfm

Name		Objectives	Funder(s)	Implementing Agency(s)	Type of project	Duration	Priority Sector(s)	Geographic focus (if any)
			an agenda to improve local research to develop traditional and emerging energy technologies.[257]					
5.	Interdisciplinary and Participative Research on Interactions between Ecosystems, Climate and Societies in West Africa[258]	The project will identify the relations between ecosystem vulnerabilities and human populations in order to scientifically support political responses to climate change.	France's Foreign Affairs Ministry	Agence inter établissements de la recherche pour le développement (Inter-institutional Research Agency for Development)	Research	2007 – 2011	Ecosystem conservation	*Regional:* Benin, Burkina Faso, Cameroon, Cape Verde, CAR, Chad, Côte d'Ivoire, Gambia, Ghana, Guinea, Guinea-Bissau, Mali, Mauritania, Niger, Nigeria, Senegal, Togo
			In Nigeria: not known					
6.	Advancing Capacity for Climate Change Adaptation (ACCCA)[259]	The rational for this project is that countries lack scientific knowledge and understanding of climate risks, and that this is an impediment to addressing climate variability. Activities include the following: identify and prioritize climate risks; assess available knowledge about risks and adaptation opportunities; develop, test, and disseminate risk communication materials that are designed to	IDRC; DEFRA; Swiss Federal Office for the Environment; NCAP; European Commission	UNITAR	Assessment; Capacity building; Policy formation and integration	2007 – 2010	Multi-sectoral	*Global:* 17 countries in Asia and Africa[260] including Burkina Faso, Ghana, Mali, Niger and Nigeria

[257] http://www.helio-international.org/VARNigeria.En.pdf.
[258] http://www.aird.fr/ripiecsa/index.htm.
[259] ACCCA, http://www.acccaproject.org/accca/
[260] *African countries include*: Burkina Faso, Cameroon, Ethiopia, Ghana, Kenya, Malawi, Mali, Niger, Nigeria, Tanzania, Tunisia and South Africa. *Asian countries include*: Bangladesh, India, Mongolia, Nepal and the Philippines.

Name		Objectives	Funder(s)	Implementing Agency(s)	Type of project	Duration	Priority Sector(s)	Geographic focus (if any)
		assist adaptation decisions; and identify critical knowledge gaps that impede effective adaptation decisions.	*In Nigeria:* "Community-led Climate Adaptation Program for Sustainable Livelihoods in Coastal Areas."[261] The objective is to promote self-help livelihood groups to implement indigenous climate change adaptation options and poverty alleviation strategies. Local context-specific needs and adaptation strategies will also be communicated to influential decision-makers. • *Implementing Agency:* University of Ibadan					
7.	Supporting Integrated and Comprehensive Approaches to Climate Change Adaptation in Africa (or Africa Adaptation Program – AAP)[262]	Under this program, UNDP will assist 20 African countries in implementing integrated and comprehensive adaptation actions and resilience plans. The projects will ensure that national development processes incorporate climate change risks and opportunities to secure development gains under a changing climate. UNDP will help countries establish an enabling environment and develop the capacity required to design, finance, implement, and monitor long-term and cost-effective adaptation policies and plans.	Japan International Cooperation Agency Budget: US$92.1 million	UNDP	Capacity building; Policy formation and integration; Knowledge communication	2008 – 2011	Government	*African:* 20 African countries[263] including: Burkina Faso, Ghana, Niger, Nigeria, Senegal
			In Nigeria: To promote an integrated approach to adaptation in Nigeria through building the governance system, empowering children as change agents and demonstrating adaptation. • *Implementing agency:* Ministry of Finance					
8.	Integrating Climate Change Mitigation and Adaptation into Development Planning[264]	START and its partners are engaging scientists and policy makers in West Africa, East Africa and South Asia in a range of activities that aim at raising awareness and improving access to scientific information, so that decision-makers can better integrate climate change issues in development planning and poverty reduction measures. The activities include national science-policy dialogues, regional knowledge	European Commission; UNEP; USAID	START with WMO, IPCC, UNEP, University of Dar es Salaam, University of Ghana, and the Bangladesh Centre for	Capacity building; Assessment; Policy formation and integration	2009 – 2010	Government; Agriculture; Urban areas; Peri-urban areas	*Global:* Bangladesh, Bhutan, Burundi, Ghana, Nepal, Nigeria, Rwanda, Senegal, Tanzania

[261] http://www.weadapt.org/placemark/311

[262] ALM, http://www.adaptationlearning.net/program/africa-adaptation-programme and UNDP-APP, http://www.undp-aap.org/

[263] These countries are Burkina Faso, Cameroon, Congo, Ethiopia, Gabon, Ghana, Kenya, Lesotho, Malawi, Mauritius, Morocco, Mozambique, Namibia, Niger, Nigeria, Rwanda, Sao Tome et Principe, Senegal, Tanzania and Tunisia.

[264] START, http://start.org/programs/ccmap

Name		Objectives	Funder(s)	Implementing Agency(s)	Type of project	Duration	Priority Sector(s)	Geographic focus (if any)
		assessments, regional knowledge sharing strategies, and regional trainings. It also includes assessments of climate change risk to agriculture in nine urban and peri-urban areas.		Advanced Studies				
			In Nigeria: To be determined					
9.	Groundwater in sub-Saharan Africa: Implications for food security and livelihoods[265]	The project aims to enhance the role of groundwater in providing improved food security and livelihoods in the countries targeted by AGRA. The specific objectives include: assessing groundwater availability and sustainability, including the impacts associated with its use and role in adapting to climate change; identifying opportunities and constraints in using groundwater, and provide advice to investors in groundwater interventions; and developing a groundwater strategy for the region.	Alliance for a Green Revolution in Africa (AGRA)	International Water Management Institute	Research; Policy formation and integration	2009 – 2011	Freshwater supply	*African:* Burkina Faso, Ethiopia, Ghana, Kenya, Malawi, Mali, Mozambique, Niger, Nigeria, Rwanda, Tanzania, Uganda, Zambia
			In Nigeria: To be determined					
10.	Lake Chad Sustainable Development Support Program (PRODEBALT)[266]	To promote sustainable development in the Lake Chad Basin, this project will do several things: clean out the Vrick canal to augment the volume of water flowing into the lake; undertake feasibility and implementation studies on transferring waters from the Oubangui River in the Central African Republic to the lake; and undertake studies to reduce the water losses provoked by the many small dams built on the waterways feeding the lake. Judicious, integrated management of the basin's natural resources is expected to increase the incomes of the target	African Development Bank, Government of Chad, other co-financing Budget: US$95 million	Lake Chad Basin Commission	Field implementation	2009 – 2015	Watershed management	*African:* Cameroon, the Central African Republic, Chad, Niger, Nigeria,
			In Nigeria: To be determined					

[265] IWMI, http://gw-africa.iwmi.org/
[266] AfDB, http://www.afdb.org/en/projects-operations/project-portfolio/project/p-z1-cz0-002/#

Name		Objectives	Funder(s)	Implementing Agency(s)	Type of project	Duration	Priority Sector(s)	Geographic focus (if any)
		populations, particularly women, by 67% on average, and to improve food security. One of the project's specific objectives is to improve the adaptive capacity of the lake's productive systems to climate change.						
11.	West African Science Service on Climate and Adapted Land Use[267]	The project aims at generating knowledge and developing analytical capabilities in West Africa to cope with climate change by the design of resilient land-use systems and the development of measures to conserve or restore healthy ecosystems that allow sustainable development. It relies upon cooperation between the West African research community and the expertise existing in Germany on climate change and adapted land management.	German Federal Ministry of Education and Research	University of Bonn	Research	2010 – 2011	Agriculture; Ecosystem conservation	*Regional:* Benin, Burkina Faso, Cote d'Ivoire, Gambia, Ghana, Mali, Niger, Nigeria, Senegal and Togo
			In Nigeria: To be determined					
12.	Great Green Wall[268]	The project will address desertification and food security through the creation of a biological corridor along participating countries. The goal is to increase investment in appropriate sustainable land and water management and technologies. In addition the project seeks to encourage cooperation within and among participating countries and for countries to incorporate evidence-based policy development. The program's goals are to: "expand investment in sustainable land and water management technologies in order to help communities adapt production systems to climate variability and change; improve land use planning; and improve	LDCF; SCCF; World Bank; AfDB *Budget:* US$3.108 billion		Capacity building; Research; Policy formation and integration	2011 – ?	Agriculture; Ecosystem restoration	*African:* Benin, Burkina Faso, Chad, Djibouti, Eritrea, Ethiopia, Ghana, Mali, Mauritania, Niger, Nigeria, Senegal Sudan and Togo
			In Nigeria: More information required.					

[267] http://www.lap.uni-bonn.de/research/research-projects/wascal?set_language=en
[268] GEF, http://www.thegef.org/gef/node/4503

Name		Objectives	Funder(s)	Implementing Agency(s)	Type of project	Duration	Priority Sector(s)	Geographic focus (if any)
		climate and water monitoring network improvements, institutional cooperation within and across countries, and evidence-based policy development."[269]						

D. Proposed Adaptation Action

In its 2003 National Communication, Nigeria identified five priority projects for implementation at the national level. These projects focused primarily on increasing the availability of meteorological information, strengthen climate change modeling and increase public awareness of the potential impacts of climate change.

Table 4: Priority projects identified in Nigeria's First National Communication on Climate Change (MEFRN, 2003)

Name		Objectives	Project Type	Priority Sector(s)	Geographic focus (if any)
1.	Modeling and Verification of Severe storms (cyclonic depressions) in the Niger Delta, Nigeria	To lead research on cyclonic depressions so that advisories can be issued to Governments and their Agencies and to establish adaptation measures a priori of storm occurrence.	Research; Knowledge communication	Climate information services	National
2.	Generate Climate Modeling (GCM) of Temperature/ Precipitation and Crop Yield relationship for Food Security	To predict crop yields under normal and doubled carbon dioxide scenarios for the formulation of Food Security Policies through early warning systems and to identify crops that are most vulnerable in terms of poor yield and low quality under extreme climate conditions.	Research	Agriculture; Disaster risk management	National
3.	Creation of Public Awareness on Climate Change	To raise awareness of the general public in order to integrate measures in the programs to reduce the emission of the GHGs and, where necessary and to cooperate on adaptation measures	Knowledge communication	Civil society	National
4.	Improving the Quality of Meteorological Data for Climate Change Impact and Application Studies	To improve the availability and quality of meteorological data in Nigeria.	Research	Climate information services	National

[269] IISD, http://climate-l.iisd.org/news/gef-council-approves-programme-that-includes-great-green-wall-initiative/

5.	Climate Change Impacts and Vulnerability Assessment in the Sudan-Sahel Region	To study the impacts of climate change on physical and socio-economic sectors of the Sudan – Sahel region and to propose adaptation strategies.	Assessment	Rural areas	National

E. Assessment

Current adaptation initiatives in Nigeria focus on the agriculture sector, ecosystem conservation and strengthening the capacity of government to respond to climate change adaptation needs. In the agricultural sector, most current projects involve awareness raising activities and vulnerability assessment; they do not seem to include some of the small-scale activities that are indicated as adaptation priorities in Nigeria's National Communication. As well, the current coastal management project, "Community-led Climate Adaptation Program for Sustainable Livelihoods in Coastal Areas" implemented as part of the ACCCA program also appears to have not involved implementation of the activities suggested in Nigeria's National Communication. Instead, this project focuses on decision-making and the integration of local populations' concerns in coastal management policies. As a result, the small-scale activities indicated in Nigeria's National Communication as "adaptation measures [that] are open to Nigeria" do not appear to be targeted by current adaptation initiatives.

Moreover, the priority adaptation projects identified in Nigeria's National Communication and presented in Table 4 also appear to remain unaddressed at the moment. Implementation of these projects would probably help to reinforce the capacities of the Nigerian Meteorological Agency, which is in charge of performing systematic observations and analyses for forecasting purposes, and is also engaged in the monitoring, management and mitigation of natural disasters and climate change impacts (MEFRN, 2003). However, it is unclear if Nigeria is seeking support for the undertaking of these activities, or the degree to which these needs have been met since Nigeria's National Communication was submitted in 2003. Additional gaps in adaptation focused program appears to be in the areas of human health and (although touched upon in current efforts) freshwater resources, coastal zone management and gender issues.

Although the number of adaptation projects and programs occurring in Nigeria is limited, particularly given the size of its population and its potential vulnerabilities, the country appears to be taking positive steps towards the development of a policy framework able to guide future efforts. In particular, should the planned Nigeria Strategic Climate Change Trust Fund be established, it could provide Nigeria with greater capacity to understand and manage climate change risks and to strengthen implementation of its priority adaptation actions.

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