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FACTS ON CLIMATE IN NIGERIA #5 REPERCUSSIONS FOR COASTAL ZONE AND MARINE ECOSYSTEMS

Climate change has become our new reality. It brings with it changes in weather patterns that can have serious repercussions for all of us, upsetting seasonal cycles, harming ecosystems and water supply, affecting agriculture and food production, causing sea-levels to rise. Climate Change causes floods, landslides, drought and famine. As weather becomes fiercer and storms increase in frequency and intensity, serious socio-economic consequences result. Malnutrition and disease become common occurrences. Climate change has a cumulative effect on natural resources and the balance of nature.

Its effects are already visible in Nigeria. This series of Fact Sheets identifies present and future challenges and suggests ways of managing and adapting to the climate change process. (For a full picture of climate change in Nigeria, refer to the other four Fact Sheets: #1, Health and Human Settlements; #2, Water Resources, Wetlands, and Freshwater Ecology; #3, Energy, Industry, Commerce, and Financial Services; and #4, Agriculture, Food Security, Land Degradation, Forestry, and Bio-Diversity.)

What's the problem?

The low lying coastal zone covers about 3% of Nigeria's entire land surface and harbours some of the most strategic industries for economic growth in this country. It is also home to more than 6 million Nigerians. Its shores, swamps and offshore areas, particularly in the Niger Delta, are conspicuously dotted with oil prospecting and production/storage facilities. Non-oil and manufacturing industries also originate here. These areas are also highly productive as fishing grounds, and at the same time, provide a vast reservoir of crude oil which is being aggressively explored and exploited.

The coastal zone—rich in biodiversity—is an amalgamation of a variety of ecosystems which offer sanctuary and habitat for diverse biological life. Yet the low-lying nature of Nigeria's 800 km-long coastline makes the coastal zone and marine ecosystem region particularly vulnerable to climate change. It is prone to sea-level rise and salt-water intrusion which contaminate coastal fresh water resources. Mangroves are receding due to wave incursion and beach breaching; their ecosystems largely sustain the rich bio-diversity of the coastal zone. Upland water shows evidence of increased salinization. Sea-beds worked over by storm waves threaten offshore buried oil pipelines, with the worse-case scenario being rupture and oil spillage. Offshore oil spillage seriously affects the livelihoods of local fisher-folk and upsets the balance of nature for the coastal zone and marine ecosystems.

There is a high frequency of coastal erosion and flooding in this region, all of which are climate change-induced forms of land degradation. (See Fact Sheet #4, Repercussions for Agriculture, Food Security, Land Degradation, Forestry, and BioDiversity.)

What will happen here if Climate Change is not addressed?

Climate change will negatively alter Nigeria's different ecological zones in many ways. The most obvious will be reduced water volume in streams and rivers, the drying up of water sources, the loss of vegetation in head waters. Higher waves generated by south-westerly onshore storm winds will cause beach erosion and coastal flooding. The integrity of coastal engineering infrastructures and many industrial facilities are already undermined by storm wave scouring and wave run-up, and vulnerable to possible closure of operations and job loss.

Future sea-level rise will critically affect this sector. Groundwater will become salinized and require populations to relocate. The mangrove ecosystem will be dramatically transformed and result in the loss of its biodiversity. The Cross River, for example, is the richest fishery ground in Nigeria because of its large mangrove ecosystem which acts as a sanctuary for young fish until they mature and move to larger bodies of water. It is extremely vulnerable to climate change.

Beach properties will be destroyed; inward property, buildings and roads will be threatened; businesses and residential owners will be forced to relocate. (This is already happening at Bar Beach, Lagos.) Land will be lost, and may become completely submerged. Cities like Lagos, Warri, Port Harcourt, Eket, and Calabar could become annihilated. Livelihoods will be affected. A refugee situation could occur.

Severe storms will upset the ocean mix by creating large wave action. Not only will this upset the bio-diversity in the region but it will threaten sea-going vessels and crew, and

adversely affect oil and gas transportation, the shipping of goods, and commercial fishing trawling. Economic growth for Nigeria will not only be retarded, but will take a downward spiral and increase poverty and unemployment. Extreme storm surges also spell danger to human- and animal-kind.

How do humans add to the problem?

Human activity contributes to the problem in a variety of ways, from discharging waste (including human waste) directly into waters before ebb-tide at beach locations (such as Ibeno) thereby polluting regional waterways, to exploiting water resources. (See Fact Sheet #2, Repercussions for Water Resources, Wetlands, and Freshwater Ecology.)

What can we do about it?

There are a number of strategies that can be adopted, some of which are already practiced. Beach nourishment to halt erosion (an activity in Bar Beach, Lagos), shoreline embankments using sheet pilings and moles (Marina, Lagos) and sandbags to shore up individual dwellings (Niger Delta region), pole-raised houses (Lagos Lagoon), floating houses (Niger Delta), retreat and abandonment of coastal property (Bakassi), and instituting buffer or set-back lines are all effective against coastal erosion and flooding.

Using river or stream water as drinking sources, or collecting water for drinking at ebb-tide, will help, as will discharging wastes (human or animal) at high water time to be flushed out to sea, using motor bikes for transportation, deploying boats at high tide, and using beaches for large recreational gatherings. The use of mariculture, and fishing activities targeting migration patterns, are also strategies for adapting to climate change.

There are other techniques that can be adopted in future. Stabilizing selected shorelines, where possible, is one. Defining and enforcing a set-back line for land development is another. (Currently, some developments take place too close to shorelines and river/stream banks.) Beach-sand mining could be prohibited in favour of river-sand mining; wetlands could be re-vegetated and restored; mariculture and aqua-culture could be intensified. Plans to abandon permanent structures threatened by sea-level rise could be developed, flexible and mobile coastal infrastructures could be designed; deep offshore development technology could be encouraged.

Perhaps the most important strategy for climate change preparedness would be the institution, in Nigeria, of early warning systems against extreme coastal events. As well, the Nigerian public must be educated on climate change and how it will affect all of human activity.

What's preventing us from doing all this?

Perhaps the biggest obstacle is lack of awareness and knowledge. Nigerians need to be educated and informed about climate change and how it can change our lives drastically.

Old habits and resistance to change are probably the biggest obstacles to taking preventative and adaptation measures against climate change. That, and the lack of public awareness. Pollution, gas-flaring practices, oil spillage in the marine environment—these all contribute to the problem. A depressed economy, a low technology approach, high population growth, cultural beliefs, lack of livelihood opportunities, loss of holdings, youth development and aggression issues—all are obstacles to tackling the problem.

Technological advancements could help to overcome some of these obstacles, as could public education and government policies. But responding to the threats imposed by climate change on society, on flora and fauna, on ecosystems and bio-diversity appears to be a low government priority and so there is insufficient funding to encourage taking any positive action to combat climate change in this country. There is a dearth of public policies that target adaptation, and those that do exist are inadequate. The Nigerian government must adopt strategies and policies now that will encourage industries to adapt to climate change to everyone's benefit.

Why should we concern ourselves?

The impact of climate change on Nigeria will be far-ranging. Especially felt will be the impact on water resources, and on the coastal zone and marine ecosystems of this country. About 80% of the coastal zone is threatened by sea-level rise and inundation, which spells doom for its inhabitants. Whole communities will be forced to relocate, refugee problems could result and the attending socio-economic problems that develop will be dire.

It is obvious that unless we concern ourselves now, it will be too late to help Nigerian society take preventative measures, and we will end up being ill-equipped to deal with our new reality.