Drought Conditions and Management Strategies in Nigeria.

Background

Location*:* Nigeria is located in the West of Africa and lies between latitudes 4° and 14° N , and Longitudes 3° and 15°E

Population: The March 21st, 2006 census put Nigerian population figure at 140,003,542 million. It is now estimated to be 178,516,904 million by **Worldometers** as at July 1, 2014.

The menace of Drought and Desertification is one of the ecological disasters currently plaguing the country. About eleven (11) out of the thirty-six (36) states of the country fall within the desert prone zones. These frontline states are: Adamawa, Borno, Bauchi, Gombe, Jigawa, Kano, Katsina, Kebbi, Sokoto, Yobe and Zamfara. These states have an estimated population of about 43 million people (2004 projection) and occupy about 397,222 Square Kilometre of Nigeria's total land (Fig.1)

Nigeria is experiencing unfriendly climate conditions with negative impacts on the welfare of millions of people. Persistent drought, delay in onset of rains, early cessation of the rains and short rainy season including pronounced dry spells have caused low agricultural productivity for a country that is mostly dependent on rain fed agriculture. Inadequate water resources resulting from reduction in quantity of river flow and Lakes have fewer water supplies for use in agriculture, hydropower generation and other uses. The main cause of all these havocs is the changing climate.

Arid and semi-arid areas in Northern Nigeria are becoming drier and Sahara Desert characteristics are encroaching fast into the country. We already have an increasing incidence of diseases, declining agricultural productivity and rising number of heat waves.

Declining rainfall in already desert-prone areas in Northern Nigeria is causing increasing desertification. The Northern part of Nigeria is endowed with a large expanse of arable land that has over the years provided a vital resource for agriculture and other economic activities, but the Sahara desert is advancing Southward at the rate of 0.6km every year [1]. Consequently, Nigeria loses about 350,000 hectares of land every year to desert encroachment[5]. This has led to demographic displacements in villages across 11 states in the North. It is estimated that Nigeria loses about $5 billion every year due to rapid desert encroachment and drought (World Bank, 2005). About 5 million livestock are being threatened by desertification according to estimate from states Ministry of Environment. The Fulani population is known to be mostly affected as their herdsmen are constantly seeking new grazing lands and water as a result of the desert encroachment.

Drought Monitoring and Early Warning System

Droughts occur throughout the length and breadth of Nigeria. However, they are more frequent and much more severe in the Sudano-Sahelian States of ***Kebbi, Sokoto, Zamfara, Katsina, Kano, Jigawa, Yobe, Gombe and Borno.*** It is in these dry belt areas that drought of disaster scale occurs from time to time, hence the need for a close monitoring over this region in order to identify its onset, intensity, cessation, duration and spatial extent as well as its frequency (Tab.1) in a timely manner for its proper management by Nigerian Meteorological Agency (NiMet).

Drought monitoring using **Standard Precipitation Index (SPI),** over **five** stations located in the extreme Northern States of Nigeria, namely Sokoto, Zamfara, Katsina, Yobe and Borno showed that drought occurrence was first noticed in 1968 with a Standardized Precipitation Index value of (–0.34), indicative of a mild drought, was recorded for that year. These negative **SPI** values of drought episodes continued up to 1973, with the exception of 1970, were immediately followed by a wetter period of (1974-1980) which were of positive values.

The Extreme Northern States comprising these stations witnessed the longest drought episodes, which lasted for nearly a decade and half (1981-1997). This period was characterized by absolute dryness except, of course, 1988 and 1994 years that were wetter with positive values. However, there were moments of respite in the later years (1996-2004) during which drought episodes were fast recovering from dryness to wetness. Generally, however, the mean annual *SPI* values ranged between (–0.3 and –1.47) with the year 1987 recording the severest drought episode throughout the period under consideration. (figure 2)

In 2009 however, NiMet moved further from annual SPI to monthly production of Flood and Drought Monitoring Bulletin as a standard drought monitoring tool in line with World Meteorological Organization (WMO). The bulleting is one of the Agency's important early warning tools which provide adequate information in line with different types of drought. These are; 1-Month (meteorological and agricultural drought), 3-Month (meteorological and agricultural drought), 6-Month (groundwater drought), 12-Month (stream-flow and lake storage drought) see fig.3 in annex

Impacts of Drought

The impacts of Drought are extremely serious and often dramatic particularly for the most vulnerable groups-Women and children, because during emergency Men leave them behind and migrate to the cities in search of support. Women are faced with the responsibility of providing water, Energy, Food and rearing of domestic animals.

Yobe State is one of the states within the Sudano-Sahelian zone of Nigeria that was affected by drought, locust, and quella bird’s invasion in 2004. This resulted in heavy losses in crops, livestock and fodder for livestock

The drying up of rivers, ponds and other water bodies resulted in increased aridity of the area with accompanying hard socio-economic condition on the inhabitants of the affected communities. The local government areas severely affected in the state included: Yusufari, Yunuri, Karasuwa, Machina, Geldam, Nguru, Bursari, Bade and Jakusko.

Magnitude of Devastation and Losses in Yobe Drought

Crop failure: A high degree of crop failure especially millet, sorghum, and rice were recorded in all local government areas. The total tonnage of grains lost in the area was estimated to about 330,000 metric tonnes valued at about ₦15billion[1].

Migration: Large populations of the affected states migrated southwards and some aliens from the neighboring Niger republic migrated into the country and this led to unprecedented and drastic rise in the prices of commodities (Tab.2).

Loss of livestock: The Drought situation resulted in poor establishment of pastures in the rangelands leading to acute fodder shortage. The result was high loss of livestock due to malnutrition and infestation by flies and liver flukes.

Low fish production: Due to the early drying up of the water bodies in the state, fishing activities were grossly hampered and the usual fishing (Daba) could not be carried out along the river systems at Gashua, Nguru, and Geldam. Some fishermen migrated down to River Benue.

Biodiversity loss: As the drought causes recession of water some species of the flora and fauna that are not drought resistant are lost while resistant ones (fauna) migrate to saver heaven and adapt.

Environmental effect: The Drought and the attendant locust invasion dealt a devastating damage to the ecology of the affected communities in the state.

Short Term Measures to Mitigate the Effects of Drought

- Emergency relief materials were dispatched to affected communities in form of food stuff, medication and tents.
- Provision of feed supplement for livestock
- Provision of irrigation and water pumps
- Rehabilitation of degraded Oases in some local government areas
- Establishment of rangeland of about 20 hectares in each of the local government areas
- Survey and demarcation of 2 hectares drought rehabilitation centre in each of the local government areas to manage refugees

Vulnerability Assessment

The Sudano-Sahelian regions of Nigeria are the most vulnerable areas to drought and desertification processes. These regions already have low level of biological productivity, organic matter and aggregate stability. Their vegetation and plant covers are relatively sparse, and soils are relatively more susceptible to accelerated erosion by water and wind. People at risk and at loss in the Sudano-Sahelian region are more than 19 million and 17 million respectively.

The most vulnerable sector to drought in Nigeria is the water resources. Water resources represent a major prerequisite and driver of social-economic development and cater for other economic sectors such as; domestic, agriculture and fisheries, industry, bio-diversity, power and energy generation

Agriculture is one of the main economic activities in Nigeria and accounts for around 40 percent of the country's GDP and employs about 60 percent of the active labour force thus drought would lead to a catastrophe with unprecedented repercussions[1]. Agricultural production is reduced in periods of drought, majority of the populations in the drought prone areas are peasant farmers, living on marginal lands in rural areas and practicing rain fed agriculture. Drought threatens agricultural production on these marginal lands, exacerbating poverty and undermining economic development. The poor crop yields due to drought result in mass poverty and starvation as agriculture is the mainstream of Nigeria's rural economy.

One of the most important effects of drought is the depletion of biodiversity. Existing fauna and flora that are not resistant to drought are likely to go extinct. Studies have shown that several animal and plant species are disappearing in the drought prone region of Nigeria. The combined effects of drought and bush burning (during dry season) have made the flora to go extinct and the animals migrate to safer havens. Drought, land degradation and desertification have had serious impact on the richness and diversity of plants and animals in the dry land region. Plant biodiversity will change over time. Emerging and invasive species will dominate and total biomass production will be reduced.

The impacts of drought and desertification on the energy sector are felt primarily through losses in hydropower potential for electricity generation. In Nigeria, electricity is largely generated through hydropower, thus drought is likely to reduce the volume of water in dams and rivers and consequently lead to reduction in hydro-electricity generation and hence load shedding of electricity in the country. Energy impacts can also be experienced through reduction in the growth rate of trees due to drought. Majority of peasant people in Nigeria rely on fuel wood as source of energy

Emergency Relief and Drought Response

The National Emergency and Management Agency (NEMA) is the institution mandated to handle disasters in Nigeria. The institution is responsible for providing relief in times of drought. Relief materials dispatched to affected communities are mainly food stuffs.

In Yobe state, the drought that occurred resulted in the loss of about 3,142 metric tons of expected harvest. Virtually all the local government areas were affected. Relief materials given to affected communities amounted to about ₦40.4million. In addition about ₦120million was provided by the Federal Ministry of Environment for provision of irrigation equipment.

The agency usually network with stakeholders to undertake hitch-free direct distribution of relief to the affected persons. Stakeholders include: State Emergency Management Agency (SEPA), the Red Cross Society, NGOs, CBOs, affected Local Government Officials, Opinion leaders/Traditional Rulers of the affected communities and the Nigeria Security and Civil Defense Corps. The distribution of relief items is based on request from affected communities.

National Strategic Grain Reserve

In addition to NEMA, the Federal Government of Nigeria established the Strategic Grain Reserve as one of the coping measures in order to reduce risk of drought. The scheme has twelve silos with a total storage capacity of 350,000 metric tonnes. In addition to the silos capacity, there are various warehouses for storage of grains. Contract was awarded for construction of 20 additional silos with storage capacity of over one million metric tonnes. Figure 4 (annex) shows the locations of all silos in Nigeria (completed and ongoing). When completed the total silos capacity will be one million, three hundred and fifty thousand (1, 350,000) metric tonnes. The silos storage will boost the national capacity to reduce risks of drought.

Drought Alleviating Practices.

Responses embarked by government include the following;

- ✓ Institutional Arrangements leading to the creation of Federal Ministry of Environment and the Drought and Desertification Amelioration Department.
- ✓ Management of Water Resources by the establishment of River Basin Development Authorities to promote sustainable utilization of water resources in the dry land.
  Use of Drought tolerant (hybrids) crop varieties in the drought prone regions by farmers.
- ✓ Production of National Action Plan(NAP) as part of the National Economic and Environmental Protection plan and making the NAP Coherent with other environmental strategy and planning framework
- ✓ Linking the NAP with National, intra-Regional and local approaches. Measures taken within the framework of NAP include adequate Diagnosis of past experience
- ✓ New projects/strategies initiated as part of implementation process since the last NAP report in 2002 includes:
- ✓ Sand dune fixation
- ✓ Rangeland establishment
- ✓ Oasis inventory and rehabilitation
- ✓ Drought forecasting
- ✓ Formulation of drought and desertification policies

- ✓ Development of National drought preparedness plan
- ✓ Development of Drought and Desertification policy
- ✓ Rainwater harvesting
- ✓ The Great Green Wall program to halt desert encroachment
- ✓ Preparation and implementation of the National Biodiversity Strategy and Action Plan (NBSAP) to halt the loss of biodiversity.

The Need for Knowledge and Skills on Drought Management

- ✓ Strengthen the capacity of the Federal Ministry of Environment (Drought and Desertification Amelioration Department) to coordinate activities for combating desertification and mitigating the impacts of drought. This will enhance response effectiveness, adequate preparedness planning and maximize mitigation efforts.
- ✓ Capacity building for drought monitoring, assessment and forecasting particularly for NiMet as an institution using climate elements in this respect for proper implementation of Drought monitoring and preparedness plan.
- ✓ Valuation of biodiversity: We cannot manage what we do not value hence valuation of biodiversity is important. Valuation of biodiversity will help in the integration of biodiversity into national planning for sustainable development. There is lack of manpower on this hence the need for capacity building in this area.
- ✓ The Economies of Ecosystem Services and Biodiversity (TEEB) National studies: This study is needed to establish the water, soil, biodiversity and forest accounts which will lead to proper land use management hence, the need for capacity building in this area.

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