COMBATING AND MITIGATING DROUGHT AND DESERTIFICATION IN NORTHERN NIGERIA

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ABSTRACT
Drought and desertification are natural hazards that affect man and his activities and if prolongeed may lead to disasters. Unlike other natural hazards, these two twin hazards (drought and desertification) creep in unnoticed and before one realizes their presence, a lot of damages have been done. Northern Nigeria, especially the part bordering the southern Sahara desert is proned to drought (and desertification). Sometimes, their occurrences are severe and bring untold hardship to the inhabitants like the 1978 – 1982 droughts. This paper attempted to review the hazards, causes effects and ways of combating and mitigating against them. Data were obtained from past literatures/researches on droughts. The paper shows that despite all efforts that have been made (and still going on) concerning the hazards, a lot still has to be done to fully combat or mitigate them. It is also realized that government has a role to play too. Other findings like man's actions on the ecology of the environment, natural causes and ways of combating them are discussed in the paper.

INTRODUCTION

Extreme events of weather and climate including water can dramatically cause or affect lives and livelihoods. They threaten food security (drought, floods, climate change), reduce the availability of water leading to drought, increase the spread of diseases and undermine development. A large number of vulnerable communities have grown as a result of increased urbanization, population growth in fragile areas like the coasts, lowlands and flood plains and the expansion of communities into arid zones. Any increase in the intensity and frequency of extreme events would exacerbate their vulnerability.

A natural hazard becomes a natural disaster when there is destruction of life and property. According to Jarraud (2006), 9 out of 10 natural disasters globally are weather related. This is worst in the developing countries due to their low level of technology and to even recover from the impacts, takes time. Some natural hazards affect large areas and are long-lasting. A good example is drought and some are short – lived like tornadoes. Droughts develop slowly and can affect most part of a continent and huge population over a long time.

Droughts are normal climate events. They are not at all rare but their characteristics like drawn and severity can vary considerably in time and space. The amount of rain received in a season or the effects could be normal but may occur at the end of the period or come only in short, intense downpours that runs off immediately. Human activity and the demand on available freshwater resources for use by people and livestock can exacerbate the impacts of a drought and can lead straight to desertification (Aliyu, 2010)

Drought is difficult to define according to Oladipo (1993a) and it is not easily characterized either qualitatively or quantitatively. A lot of indices have been used to define drought (Hare, 1987). All these definitions point to the fact that drought occurs when there is deficiency or decrease in rainfall intensity. Persistency of drought in an area leads to desertification. Thus drought and desertification go hand in hand and one cannot form (desertification) without the other one (drought).

Desertification on the other hand is a process by which a piece of land becomes steadily dry until it virtually becomes a desert. It is a process of turning a once luxuriant area to a desert. Desert and desertification have some consequences on the people and on the environment. They are hazardous to man and if not prevented or reduced in time, can cause disasters.

SCOPE

Northern Nigeria is the focus of this paper. It is located between lat $6^0 31^1$N-$12^0 53^1$N of the equator and long $2^0 44^1$E to $14^0\ 42^1$E of the Greenwich meridian. The southern end of the region is about 240 - 256km to the coast with laid area of about 526, 400km^2 (57%) (Udo, 1985). This is an area that is proned to the occurrence of drought and desertification in Nigerian due to its location far inland to the coast. Areas

above latitude 8^0N of the equator are vulnerable but this paper makes uses of area north of lat.12^0N a proned area, of the equator. Major towns and cities found there are Sokoto, Katsina, Nguru, Hadejia, Maiduguri, Potiskum, Kano,Birnin-Kebbi and other smaller villages at the fringe of the country. These areas are highly affected by drought and desertification (fig.1). This is mostly the Sahel savanna and part of the northern Sudan savanna zones of the country.

CAUSES OF DROUGHT (AND DESERTIFICATION)

Oladipo (1993b) and World Meteorological Organisation (2006) enumerated 4 major causes of drought and subsequently, desertification – these are

i. - **anomalies due to large scale atmospheric circulation** e.g El-Nino Southern oscillation (ENSO) can be a reasonable cause. For the study area, this is not a cause but the remaining 3 factors are likely good causes of drought in Northern Nigerian.

ii. - **Land** – surface feedback mechanism and increase in greenhouse effect.

iii. - **Man's action**
- Through agricultural practices like overgrazing (without allowing the land to re-grass), continuous cropping disallowing fallowing and others.
- Bush burning
- Deforestation without afforestation
- Fragility of the soil due to misuse and killing of the living population of the soil.
- increasing population without increase in land area

iv. - **Natural Causes**
- Inability of the rain bearing monsoon to penetrate far north
- Climate change (Temperature increase causing high evaporation of the soil surface). For example, in the 90's, there was an increase of about 0.74^0c in the global surface temperature with the year 2005 as the warmest year (Jarraud, 2006)

Also, 1995-2009 was adjudged the warmest years since the industrial revolution of the 19^{th} Century (1850's). Since this time, (1850), Co_2 content has increased by 36%. All these can alter the weather of a place especially in terms of precipitation intensity.

- Natural fire either by lightning or thunderstorm as occurred recently in Australia.

ENVIRONMENTAL, ECOLOGICAL AND SOCIAL PROBLEMS OF DROUGHT AND DESERTIFICATION

Drought and desertification are twin environmental hazards (Oladipo, 1993b). For drought to become an environmental disaster depends on how the people manage their environment. Listed below are some of the problems caused by desertification and droughts in any area of occurrences. They are viewed under 3 main subheadings of environmental, ecological and social problems.

ENVIRONMENTAL PROBLEMS

- Land degradation through overgrazing with large population increase of animals in a fixed land area, through over cultivation without allowing the land to fallow or re-generate, bush burning, through deforestation, through lack or poor irrigation. All these can cause land degradation, leading to poor yield in crops and subsequently, food insecurity and death to the populace.

ECOLOGICAL PROBLEMS

- Breakdown in the ecosystem through the extermination of the flora (plants) and the fauna (animals). This has a negative impact on the soil, its fertility and compatibility.
- Sunburn's and other weather related diseases

SOCIAL PROBLEMS

- Decrease in water supply to man and animals due to dryness of wells and rivers.
- Health Problems
- Crops failures leading to food insecurity
- Death of animals and the human populace

MEASURE FOR COMBATING AND MITIGATING DROUGHT AND DESERTIFICATION

Drought and desertification are devastating natural disasters whenever and wherever they occur. Haas (1978) ranked them as the third most costly geographical phenomenon the first being earthquakes and the second as floods. The following methods can be used to combat and mitigate against them.

First, efficient use of soils especially in tillage. Where the soils are open due to less – vegetation cover, it is advised that the use of heavy tractors working on the land be avoided. Cover crops instead of deep rooted crops should be planted.

In Northern Nigeria, large scale irrigation/afforestation should be a continuous practice. Some of the dams, built years ago are aging and need replacement. These dams are source of water for irrigating the lands. The Federal and the state government can embark on aggressive afforestation programmes especially in the states bordering Niger and Chad Republic.

Majority of the people in the region are either pastoralists or sedentary subsitence farmers whose agricultural activities are in form of grazing, cultivation, bush-burning, woodcutting and poor irrigation practices have contributed to the problems. Thus, massive cropping should be done to reduce soil evaporation.

Early warning systems through which the populace will be aware of the menace, causes, problems and so on should be done. This if put in place, will help in reducing or curbing the natural disasters.

Lastly, by establishing a drought monitoring commission by the government is another step/measure. The team's mandate will cover monitoring, mitigating and providing reliefs for the affected people. In addition it will coordinate and implement all actions taken on drought and desertification for such area. This commission must be a standing one and must not be politicized. These measures are not all embracing but if put in place, can help ameliorate the effects of drought and desertification in Northern Nigeria.

THE WAY OUT

Majority of points mentioned above were unfortunately not in operation in the study area. For example, majority of the dams (earth dams) constructed in the study area for irrigation are aging and are collapsing under pressures. A good example is Tiga dam in Kano. The old dams need replacement. The same thing is applicable to wells dug in the areas for irrigation and livestock. Majority of these dams in the study area are now without water.

The local farmers (especially the livestock farmers) keep having more animals grazing on the land that is not increased in area. The crop planters are not exempted from this problem too. Population is on the increase year by year and all rely on the fixed land. Afforestation programmes embarked upon by governments some years back had suffered neglect. There are no additional acres planted with trees, yet, the local people are cutting daily those planted years before with no replacement. This aggravates the problems of desertification the more for cutting of trees exposes the land to vagaries of weather especially drought and desertification. The people too lack environmental education and thus need to be educated especially in the sustainability of the ecological features of their environment. Using a radio broadcast and giggles on television in their native language will help mitigate this problem of desertification.

The government of Nigerian sometime ago established National Committee on Arid Zone Afforestation Project and some under the Federal ministry of Agriculture. They are to monitor and check desert encroachment. Unfortunately, instability in governance and different programmes of different governments in power led to the eradication of these bodies. There is need for the government of the day to form a long lasting one. This will serve as a body to tackle the two environmental hazards. It must not be politicized and should consist of professionals in environmental areas like the hydrologists, meteorologists/climatologists, civil engineers, foresters and farmers inclusive. With all these points

mentioned above in place, the two hazards can be mitigated against if not totally curb in this part of the country.

SUMMARY AND CONCLUSION

The key to mitigating the impacts of drought and desertification is, therefore, the awareness concerning the menace and the vagaries of climate, formulation of a strong, systematic, well-coordinated, highly informed drought and desertification monitoring team for the zone. Putting all these in place will address the problems encountered with these disasters which would have taken care of the social, environmental and the economic costs needed to deal with them. That is, measures taken or designed to deal with the hazards must be able to address the problems of development and environment, as they are intertwined (Oladipo, 1993a).

RECOMMENDATION

Drought and desertification are natural disasters that man needs to fight at all cost. Aside from its impact on the ecology and the soil of Northern Nigeria, they also affect the socio-political, economic and cultural factors of development process in the area. In Nigeria, respond by administrator to drought and desertification situations is through periodic relief or tree planting, or irrigation. These measures cannot curb these disasters. They are long-term natural phenomena that need standing, well-coordinated team. Bureaucracy or politics should not be played with drought and desertification but action. In order to, save the future of our land and our children, it is recommended that the issue of these natural disasters should not be taken lightly.

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