Climate change and water supply: Case of Akoko Northeast, Southwest, Nigeria

By

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Abstract
Climate change has become more threatening not only to the sustainable development of socio-economic activities of any nation but to the totality of human existence. The present trends in human activities (burning of fossil fuels, land use practices and deforestation and release of green house gases especially CO^2 and other heat trapping gases) in Nigeria has attributed to human-induced climate change. The climate system will respond to the present increases in emissions over many decades to come and worsen the situation in the future if necessary precautions are not put in place. Result from various researches on climate change in the country has indicated increasing evaporation in catchments, and in some cases, a decreasing trend in rainfall.

Climate Change impacts depends on a range of the climate parameters' changes and on the country's socio-cultural, geographical and economic characteristics. Nigeria is located primarily within the lowland humid tropics and generally characterized by a high temperature regime almost through the year. In the far north, mean temperature is between 13^{o}C and 37^{o}C while in the south it is between 21^{o}C and 31^{o}C. The mean temperature for the country is between 27^{o}C and 29^{o}C while annual rainfall ranges between 60cm in the northeastern and over 400cm in the wet coastal area. Rainfall is the most important climatic factor in Nigeria and a crucial index for assessing water resources potential in the country.

In order to examine the variations and relationship between climate change and water supply, Akoko Northeast, Nigeria was chosen as a case study. The meteorological impacts of north central savanna grassland are fast affecting the study area. It was noted over the area that, the rainfall trend is highly deviated with $R^2 = 0.057$ while temperature shows little deviation but averagely constant values with $R^2 = 0.252$. Also, relative humidity shows consistent decrease in its annual values.

As observed recently in the area, more thermal discomfort is being felt yet sun intensity are not much. The area extent of major water supply scheme dam in the study area has reduced by 5% while the designed capacity reduced from 1,800,000 litres daily to about 1,250,000 litres daily. The trend of potable water supply decreases from 48.4litres/head/day in 1958 to 3.59litres/head/day in 2007. Persistence decrease in raindays and more sunny days are also noted to be a contributory factor to the decrease in the water supply. Nevertheless, it should be noted

that if this present trends continue without addressing global warming issue appropriately in due time, water shortage will become more frequent and severe in time to come.

Based on severe and distressing possibilities of climate change, the paper also discusses various associated risks if present pressure on water supply and the environment in the study area are not addressed.

Keywords: Climate change, Water supply and Akoko Northeast Nigeria