# IMPACT OF CLIMATE CHANGE ON LIVESTOCK PRODUCTION IN NIGERIA

## A REVIEW

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**ABSTRACT**

There is growing concern over climate and global warming issues and Nigeria is no exception. Reports from Nigeria Meteorological Agency (NiMet) have shown that there are signals of warming both in the Northern and Southern parts of Nigeria. Maximum and Minimum temperature are increasing in the regions of Nigeria. There are increased incidences of floods and erosion in Northern, Eastern and Southern States. In addition, dry spells and drought is on the increase in different parts of the country. These anomalies in weather conditions have negatively impacted livestock production in Nigeria resulting to heat stress, water scarcity, shortage of animal feed (grains and fodder), increased disease incidences as well as high morbidity and mortality rates. To combat these occurrences, it is important to construct livestock houses/pens with cross ventilation and supplement with vitamin C in water during periods of elevated temperature/ heat stress as well as increase the use of clean energy. Also, an appropriate climate change awareness campaign should be carried out.

**Key Words:** Climate Change, Livestock, Temperature, Drought

## INTRODUCTION

Climate change is one of the greatest environmental challenges humanity is facing. It occurs when there is a long-term alteration in weather patterns. Changes in climate have resulted directly or indirectly from human activity. (FAO, 2008). These human activities include burning of fossil fuels, industrial pollution, coal mining, deforestation and agriculture. These activities have resulted in the release of some green-house gases (carbon dioxide, methane and nitrous oxide) into the atmosphere. Greenhouse gases are responsible for trapping the heat on the earth's surface thus filtering off dangerous radiations. Combustion of fossil fuels has increased the concentration of carbon dioxide in the atmosphere and Nigeria contributes 90 metric tonnes of carbon dioxide per year due to natural gas flares and crude oil extraction in the Niger delta (Osuji and Avwri, 2005). While coal mining, agriculture and land-fills release more methane into the atmosphere, car exhaust and agriculture also cause accumulation of nitrous oxide in the atmosphere. All these activities have resulted in a disruption of the atmospheric balance that keeps the climate stable.

It is therefore important that concerted efforts are being made by agricultural and food security experts towards curtailing the negative effects of climate change. Similarly, some respected scientific organizations like the National Academy of Science, the intergovernmental panel on climate change (IPCC) and World Meteorological Association (WMO) are advocating for a reduction in human activities that causes climate change. Bates *et al*. (2008) advocated for widespread adoption of agricultural practices that could reduce the negative impacts of climate change thereby assisting the agricultural (livestock) sector towards growth and increased productivity, while we pursue our quest to diversify our economy.

Evidences of climate change in Nigeria are: persistent increase in temperature (fig. 1) which has resulted in increased incidences of diseases. There have been anomalies in rainfall pattern resulting in floods. The coastal areas have been frequently affected by floods due to rising sea and river levels (IPCC 2007, NAERLS and FDAE 2017 and NiMet 2017).

Seasons have been changing and there have been cases of extreme weather events such as drought and prolonged dry spells.

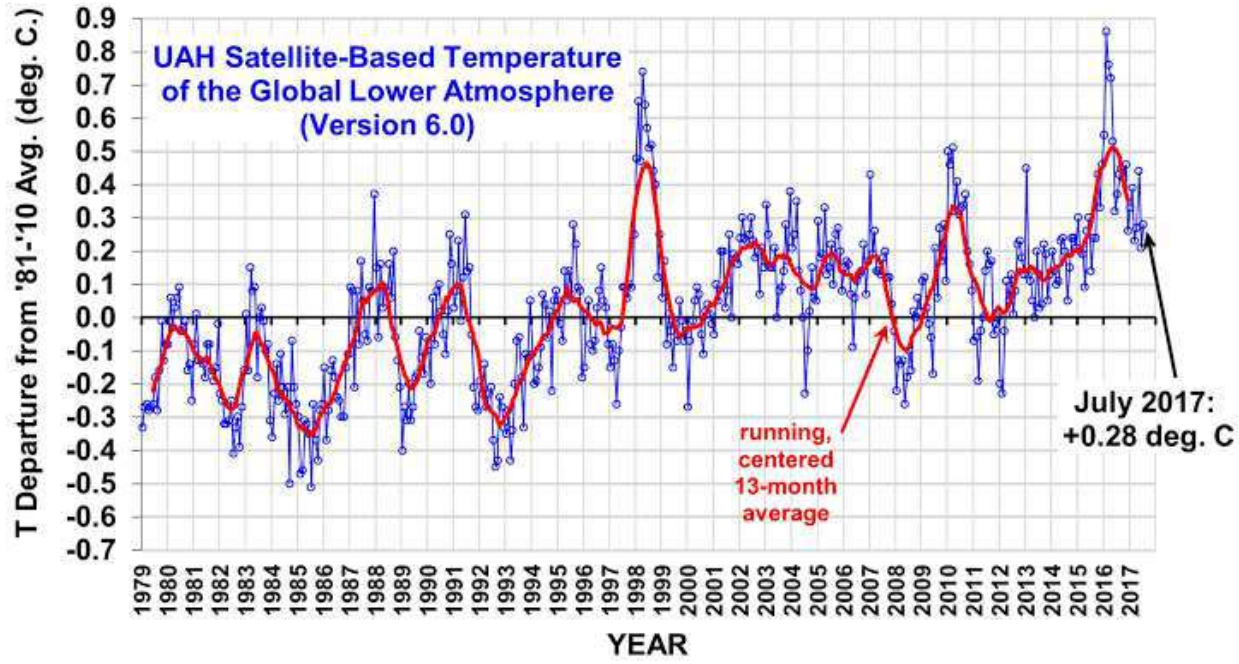


**Figure 1: Fluctuation in Temperature in Nigeria (1979-2017)**

**Source: (NiMet, 2017)**

## OVERVIEW OF LIVESTOCK PRODUCTION

Livestock refers to domesticated animals reared in agricultural settings. They are major sources of meat, milk, wool, eggs and manure. Examples are: Cattle, Sheep, Goat and Poultry. Livestock production in Nigeria contributes 20% to Agricultural Gross Domestic Product (GDP). There are basically two systems of production: Traditional (availability of land and family labour) and Modern (large capital investment)

The objectives of this paper are to identify the causes of climate change and assess the influence/impact of climate change on livestock production in Nigeria.

Agricultural activities (including livestock production) are all dependent on climatic conditions, whenever climate changes adversely, it results in increased incidences of pests and diseases, water scarcity, floods and elevated temperature/heat stress, high morbidity and mortality in livestock (Nicol *et al*., 2015). Table 1 shows the direct and indirect impact of climate change on livestock production.

**Table 1: Direct and indirect impact of climate change on livestock production system**

| | Grazing Systems | Non-grazing system |
|---|---|---|
| Direct impact of climate change | • increased frequency of extreme weather events<br>• increased frequency and magnitude of droughts and floods<br>• productivity losses resulting from physiological stress due to higher temperatures<br>• change in water availability, which may increase or decrease depending on the region | • change in water availability, which may increase or decrease depending on the region<br>• increased frequency of extreme weather events, with impact being less acute than for extensive systems of management |
| Indirect impacts of climate change | Agro-ecological changes and ecosystem shifts leading to:<br>• alteration in fodder quality<br>• change in host-pathogen interaction resulting in an increased incidence of emerging diseases<br>• disease epidemics | • increased resource prices (e.g feed, water and energy)<br>• disease epidemics<br>• increased cost of animal housing (e.g. cooling systems) |

(Source: FAO 2008)

## SOCIO-ECONOMIC IMPLICATION OF CLIMATE CHANGE

Climate change influences the socio-economic aspects of our lives, resulting in under-nutrition due to shortage of animal protein for human consumption. The profit margin of livestock products decreases due to high morbidity and mortality as well as a decline in production and reproduction.

During periods of drought, there is an increased cost of production (feed and water). Incidences of drought and reduced rainfall has extended the grazing periods of nomadic herdsmen, as a whole it adversely affects family livelihoods and income as well as the gross domestic product of the Nigerian economy. Environmental degradation due to climate change and competition for viable lands for arable and pastoral agriculture has resulted in communal conflicts. Climate change in Nigeria has incited different ethnic clashes and conflicts between herdsmen and farmers/settlers along their migratory paths resulting in socio-economic stress, tensions and high death tolls (Ogbiede, 2016).

## CONCLUSION AND RECOMMENDATIONS

The livestock sector in Nigeria is adversely affected by climate change because environmental issues such as drought/dry spells, floods and extremes of temperature of temperature and rainfall adversely affect the availability of grazing pasture for ruminants and grains for non-ruminant feeds. Increased fiber/lignification of forages results from adverse weather conditions. Where the fiber content of forages is high, the resulting impact is indigestion and low feed intake. All these climatic changes have contributed to the reduction in availability of feed for livestock production (Uyigue and Agho 2007; Atilola, 2012). Also, adverse climatic conditions severely affect production, reproduction and health of our animals. Changes in climatic conditions also causes high morbidity and mortality especially where there are extremes of temperature resulting in heat stress/stroke whereby cattle and poultry are mostly affected. Also, high humidity and extremes of temperature provides a good environment for multiplication of disease vectors resulting in high mortality rates (Das *et al*., 2016).

With the obvious challenges resulting from climate change, the following recommendations are proffered:

i) Create appropriate climate change awareness campaign.
ii) Provide more efficient fore-casting mechanisms to aid planning for farming season.
iii) More research on the role of climate change on pathogen-host environment interaction should be carried out.
iv) Promote multi-disciplinary research aimed at efficient data collection on the impact of climate change.

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