

## EARLY WARNING SYSTEM FOR CLIMATE-RELATED ISSUES OF ANIMAL PRODUCTION IN NIGERIA

<sup>1</sup>Iyiola-Tunji, A.O. and <sup>2</sup>Adamu, I. J.

<sup>1</sup>National Agricultural Extension and Research Liaison Services, Ahmadu Bello University, Zaria, Nigeria

<sup>2</sup>Nigerian Meteorological Agency, National Weather Forecasting and Climate Research Centre, Bill Clinton Drive, Nnamdi Azikiwe International Airport, Abuja.

Corresponding author's email: tunjiyiola@yahoo.com

---

### ABSTRACT

*This paper was aimed at reviewing the need for the development of an early warning system for climate-related issues in the livestock production sub-sector of the Nigerian economy. Nigerian Meteorological Agency is known to produce seasonal climate predictions which can be leveraged to provide information to livestock farmers to prevent climate-related disasters among their stocks. Early Warning System can provide useful information for livestock farmers to prevent economic losses. As it is for crop production in Nigeria, an early warning system needs to be developed for the livestock subsector of the economy.*

**Keywords: Climate Change, Early Warning System, Livestock, Seasonal Climate Prediction**

---

### INTRODUCTION

The early warning system (EWS) is a climate change adaptation strategy that uses integrated communication technologies to assist communities in getting ready for potentially dangerous climate-related events. A successful EWS promotes long-term sustainability by saving lives, jobs, land, and infrastructure (FAO, 2024). Weather and climate extremes have negatively affected livestock-dependent communities leading to significant livestock and economic losses (Patz *et al.*, 2005). In Nigeria, the Nigerian Meteorological Agency (NiMET) produces the seasonal climate prediction (SCP) which is released yearly. A breakdown of several key climate factors and how they change over the year is given by the SCP. The information provided in the SCP is tailored mainly to boost economic growth and prevent losses due to severe climate phenomena (NiMet, 2023). Appropriate early warnings of impending weather and climate disasters are a crucial component of resilience building in agriculture (NiMET, 2024). This paper is aimed at harvesting the predicted climate information that is relevant to animal production and using such to develop an early warning system for climate-related issues in animal production in Nigeria.

#### Components of SCP that are useful for EWS

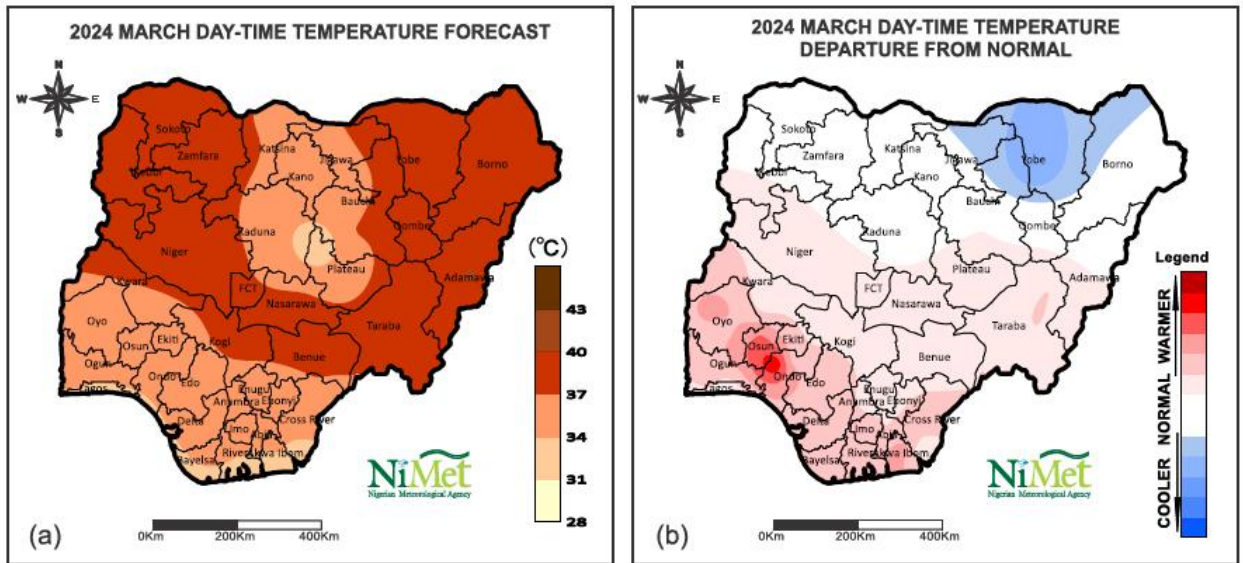
Many components of SCP are useful for EWS. Few among these components are the daytime and nighttime temperatures, and little dry season (LDS). Predicted rainfall patterns are also important, especially for pasture production. These sets of predicted information can be developed into an early warning system for livestock production in Nigeria.

#### Predicted Day and Nighttime Temperatures and EWS for Livestock Production

Depending on location, the country's first five months - January, February, March, April, and May - are when the effects of weather changes are felt the most. January is considered the cold season, while March, April, and May are considered the hot months. It is predicted that the high daytime temperature in many Northern Nigerian states will range from 37<sup>o</sup> to 40<sup>o</sup>C. Adamawa, Borno, Federal Capital Territory, Gombe, Kebbi, Nasarawa, Niger, Sokoto, Taraba, Yobe, and Zamfara are among these states (Figures 1a and b).

In the North Central zone of Nigeria, many Local Government Areas in the states of Kwara, Kogi, and Benue are anticipated to experience extremely high daytime temperatures in March 2024. It is expected that daytime temperatures in the remaining parts of the nation - apart from Akwa Ibom, Bayelsa, Kaduna, Plateau, and Rivers States - will range from 34<sup>o</sup> to 37<sup>o</sup>C. It is predicted that daytime temperatures in Lagos State and some parts of Akwa Ibom, Bayelsa, Kaduna, Plateau, and Rivers States will be somewhat lower, ranging from 28<sup>o</sup> to 31<sup>o</sup>C.

---



Figures 1a and b: Predicted daytime temperature for March 2024

### Prediction of Little Dry season and EWS

There is a period of little dry season (LDS) in between rainy seasons, especially in South-West Nigeria (Figure 2). It is also termed the August break, but the period of the LDS, as predicted for 2024, is going to be noticeable within the 3<sup>rd</sup> dekad in July (21<sup>st</sup> July) and 1<sup>st</sup> dekad of August (10<sup>th</sup> August) (NiMET, 2024). Farmers will need to adjust to the change in this period and adapt their routine activities towards alleviating the attendant effect of LDS. Little dry season comes with lower temperatures, which normally affects day-old chicks. It is important to provide warmth for the stocks during this period.

A pattern of an outbreak of African Swine Fever (ASF) has been linked to the periods of LDS in 2022 and 2023 (Onoja *et al.*, 2022, Mesembe *et al.*, 2022, Adenaike, 2023). An appropriate EWS for pig farmers against ASF during LDS will advocate for engaging in adequate biosecurity measures during the period. Currently with no available vaccine or effective treatment option, enhanced surveillance and biosecurity measures are effective in ASF control (Onoja *et al.*, 2022).

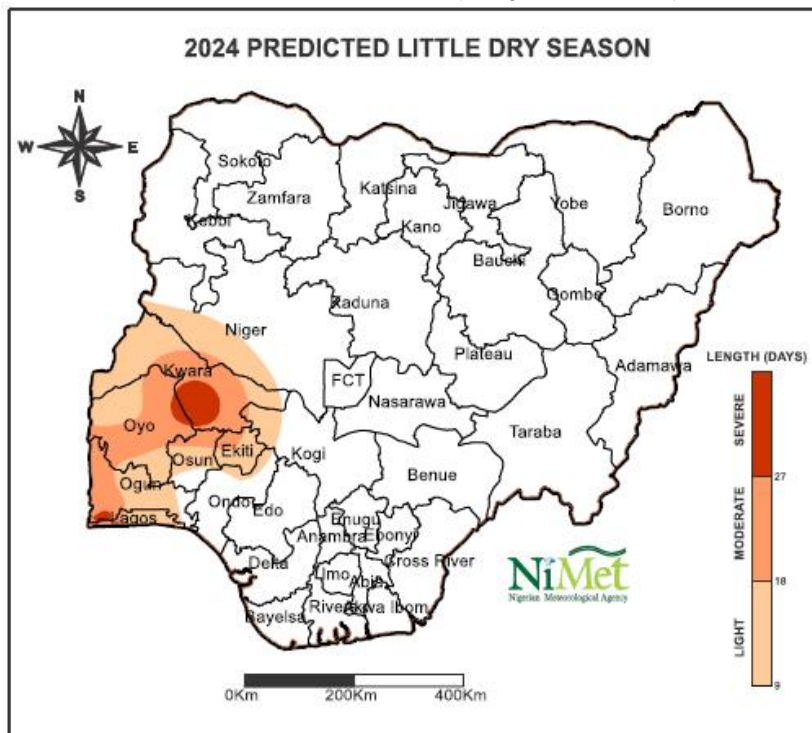


Figure 2: Predicted Little Dry Season for 2024

### **Rainfall patterns and EWS**

Ruminant animals are susceptible to some diseases during the wet and cold seasons. An example of such diseases that affect animals during the rainy season is Foot and Mouth Disease. The needed EWS is expected to provide information to farmers on the appropriate measures to take to prevent the outbreak of such diseases.

### **CONCLUSION AND RECOMMENDATION**

Early Warning System can provide useful information for livestock farmers to prevent economic losses. As it was for crop production in Nigeria, an early warning system needs to be developed for the livestock subsector of the economy.

### **REFERENCES**

- Adenaike, E.A. (2023). Effects of African Swine Fever infection on blood of pigs from selected Local Government Areas in Nasarawa State, Nigeria. *Dutse Journal of Pure and Applied Sciences*, 9(1b), 153-158.
- FAO (2024) <https://www.fao.org/giews/background/en/#:~:text=The%20Global%20Information%20and%20Early,all%20countries%20of%20the%20world>.
- Masembe, C., Adedeji, A.J., Jambol, A.R., Weka, R., Muwanika, V. and Luka, P.D. (2022). Diversity and emergence of new variants of African swine fever virus Genotype I circulating in domestic pigs in Nigeria (2016–2018). *Veterinary Medicine and Science*, 9(2), 819-828.
- Nigerian Meteorological Agency (NiMET) (2023). 2023 Seasonal Climate Prediction (SCP). [www.nimet.gov.ng](http://www.nimet.gov.ng)
- Nigerian Meteorological Agency (NiMET) (2024). 2024 Seasonal Climate Prediction (SCP). Themed: Facilitating a weather-resilient economy through early warnings for all to foster renewed hope and sustainable development. [www.nimet.gov.ng](http://www.nimet.gov.ng)
- Onoja, A. B1.; ifeorah, I. M., Jolaoso, A. O3; and Onoja, I. A4 (2022) Detection of African swine fever virus genotype ii in Domestic pigs during a hemorrhagic fever outbreak in Ogun State. *Nigeria Nigerian Veterinary Journal*, 43(3), 33 - 41. <https://dx.doi.org/10.4314/nvj.v43i3.3>
- Patz, J.A., Campbell-Lendrum, D., Holloway, T. and Foley, J.A. (2005). Impact of regional climate change on human health. *Nature*, 438(2005), 310-317,