

УДК 502.3; 504.06; 004.9

HYDROMETEOROLOGICAL EVENTS IN NIGERIA:
IMPLICATIONS FOR EARLY WARNING

Odjugo Peter Ovuyovwiroye ^{1*}, Mustapha Wahidat ¹, Kamorudeen Adesina Alao ¹,
Ugwuoke Solomon Chima ²

¹ *Nigerian Meteorological Agency, Abuja, Nigeria*

² *Ministry of Aviation and Aerospace Development, Abuja, Nigeria*

Hydrometeorological extremes (floods and droughts) are increasingly common in Nigeria and pose significant risks to lives, infrastructure, agriculture, and national development. These events result from interactions between atmospheric and hydrological processes and include floods, droughts, severe thunderstorms, windstorms, heat waves, and coastal storm surges. Their frequency and intensity have been amplified by climate variability, climate change, rapid urbanization, poor drainage systems, and environmental degradation. Among these hazards, flooding and drought are the most devastating, threatening national security and causing widespread socio-economic losses across many parts of the country. This study examines extreme hydrometeorological events in Nigeria and evaluates their implications for the effectiveness of early warning systems. It reviews their historical occurrences, spatial patterns, and impacts, particularly on vulnerable populations and critical infrastructure. The roles of key institutions responsible for monitoring weather and hydrological conditions are also assessed to determine the effectiveness of existing forecasting and warning dissemination mechanisms. The study utilizes meteorological and hydrological data, disaster records, and satellite imagery, and employs statistical, cartographic, and geospatial techniques for trend and spatial analysis. The findings indicate that flooding and drought remain the most destructive hydrological hazards in Nigeria. Although progress has been made in weather monitoring and seasonal forecasting, several constraints still limit effective early warning, including inadequate observation networks, poor data integration, weak communication channels, and low public awareness of warning information. The study highlights the need to strengthen hydrometeorological observation infrastructure, improve inter-agency collaboration, and promote community-based early warning systems. Enhancing these measures will improve disaster preparedness, reduce vulnerability, and support sustainable development in Nigeria.

<https://doi.org/10.46991/PYSUC.2026.SI1.076>

Keywords: hydrometeorological events, flood, drought, disaster and early warning.

* **Corresponding Author:** Odjugo Peter Ovuyovwiroye, Nigerian Meteorological Agency, Abuja, Nigeria. E-mail: o.odjugo@nimet.gov.ng