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**Oral Type of Contribution**

**CHALLENGES AND ITS WEATHER FORECASTING  
IMPLICATION, ATMOSPHERIC DYNAMICS AND SEVERE  
STORMS IN NIGERIA.**

**BACKGROUND**

Lagos, the commercial capital of Nigeria faced a sudden storm in the morning, Monday 13 February 2012. Rain and gusty winds of speed at 74 miles per hour, ripped off roofs and caused destruction of infrastructure including street lights and antenna in the city. The areas worst hit by the wind included Yaba, Obalende, Ikoyi, Ijeshatedo, Ago Okota, Jakande and Bucknor Estates in Ejigbo, and some areas of Lags Island. About 6 people died on land while over the coast, a canoe capsized on the lagoon in Ojo land Government area of Lagos State leaving no fewer than 10 children dead and several injured during an early morning downpour that day with accompanied by raging winds. Estimated damages amount to two (2) billion naira.

**RESEARCH AIMS AND METHODOLOGY**

This paper reviews the lessons learned from the recent disaster due to unexpected storm and also verifies the short -term change in storm characteristics. Then the paper describes on the current knowledge and the future necessary works on the evaluation of safety degree and how to forecast short term storms under current and future climates over Nigeria.

The methodology used include analysis of existing historical data and investigation supplemented by the use of visual evidence from field investigation of the post system event and data recovery where possible.

## **WHAT IS MONSOON / WEST AFRICAN MONSOON?**

Monsoon is traditionally defined as a seasonal reversing wind accompanied by corresponding changes in precipitation, but is now used to describe seasonal changes in atmospheric circulation and precipitation associated with the asymmetric heating of land and sea. Usually, the term monsoon is used to refer to the rainy phase of a seasonally changing pattern, although technically there is also a dry phase.

West Africa monsoon has a major wind system that affects West African regions between latitude  $9^{\circ}$  and  $20^{\circ}$  N and is characterized by winds that blow south westerly during warmer months and northeasterly during cooler months of the year. Although areas just outside of this region also experience wind reversals, the influence of the monsoon declines with increasing distance.

The West African monsoon circulation provides West African Countries with more than 75% of their annual rainfall. In summer, the monsoon accommodates important rainfall producing systems: the African Easterly Jet (AEJ), Tropical Easterly Jet (TEJ), African Easterly Waves (AEWs) and Mesoscale Convective System (MCSs).

## **PROBLEM STATEMENT**

Firstly, numerical models available for climate studies over West Africa are the global climate models. However, there are certain constraints using global models to examine regional climate especially in their temporal and spatial resolutions.

Secondly, the region is not well resolved in space and time and the atmospheric dynamics, structure and physical processes operating in the region are poorly understood.

Thirdly, the paucity of station data is a constraint to accurate climate production in West Africa. Even when such data are obtained for research they are basically surface data that are sparse and inconsistent.

### **Challenges and its implication of the synoptic situation over the country that day**

- From the satellite imageries the system developed between 3 am and 4 am in the morning.
- The storm was a micro system.
- The storm was brief but very powerful and the rain was not even heavy.

- The storm was short and light rain, but the breeze was terrible
- The speed of the wind, accompanied by light rain, at 74 miles per hour
- The strength of the wind ranged between 5 knots initially, then increased from 15 to 35 knots.
- Winds were north-westerlies over the southern states. with south westerlies converging into an asymptote over the coast
- That same day at 0609Z thunderstorm to south east reported and accompanied by squall at 0642Z with 35kts with trace reported rainfall amount.

### **Conclusion**

The paper concluded by drawing and addressing the following three themes: Detection, Prediction and Adaptation.