

# Weather Hazards and Their Implications on Flight Operations in Abuja Airport, Nigeria

Temi E. Ologunorisa <sup>1</sup>, Ayuba, M. Manga <sup>2</sup> and Binbol, N.L <sup>2</sup>.

Centre for Climate Change and Environmental Research, Osun State University, Osogbo, Nigeria.  
Department of Geography, Faculty of Natural and Applied Science,  
Nasarawa State University, Keffi, Nigeria.

## INTRODUCTION

It has been shown that schedule flights at our Airports are either delayed for varying periods of time intervals or in a number of cases cancelled. Many air hazards have resulted from poor visibility in Nigeria airports and other parts of the world (Kalu, 1978; Kamara, 1981 and Ologunorisa, 1999). It is on the basis that this paper examines the influence of weather hazards such as rainfall, fogs, thunderstorms and dust haze on flight operations in Abuja airport

## METHODOLOGY

Data were collected on monthly weather hazards such as fogs, dust haze, thunderstorms and rainfall from 1995 to 2004 from the Nnamdi Azikwe International Airport, Abuja. These weather elements have been identified in the literature as affecting flight operations in Nigeria in particular and the Tropics in general. Data were also collected on flight operational problems such as flight delays and flight cancellations from the Airport Domestic Terminal log book of the Federal Airport Authority of Nigeria from 1995 to 2004. The major hypothesis formulated and tested is that there is no significant relationship between weather hazards and flight operational problems in Abuja Airport. This was tested using multiple regression analysis.

The following equations were estimated:

In general form:

(a) Flight delay = f(thunderstorm, fog, dust haze and rainfall) ———(i)

(b) Flight delay = f(thunderstorm, fog, dust haze and rainfall) ——— (ii)

In specific terms,

(a) Flight cancellation = a + b1 thunderstorms + b2 fogs + b3 dust haze + b4 Rainfall + e — (i)

(b) Flight delay = a + b1 thunderstorms + b2 fogs + b3 dust haze + b4 Rainfall + e — (ii)

## RESULTS AND DISCUSSION

The results of the tested hypothesis on the effect of weather hazards on flight cancellations show R<sup>2</sup> value of 0.383. This indicates that 38 percent of the total variations in flight cancellations are explained by these variables. The F-value of 7.043 (greater than 3.84) shows that the four variables are jointly significant in predicting flight cancellations in Abuja within the studied period. Results further reveal that both thunderstorms and rainfall are significant in explaining flight cancellations in Abuja (since the F-value both of them are greater than 1.96). However, fogs and dust haze were found not to be significant.

On the effects of thunderstorms, fog, dust haze and rainfall on flight delays, a R<sup>2</sup> value of 0.526 obtain indicates that 53 percent of the total variations in flight delays are explained jointly by these variables. The F-value of 18.804 (greater than 3.84) indicates that the four variables are jointly significant in predicting flight delay in Abuja. Results also show that thunderstorms and fogs are significant in explaining flight delays in the study area. Dust haze and rainfall were found not to be significant since the absolute value of their calculated value is less than 1.96.

## CONCLUSION

Empirical results showed that thunderstorms and rainfall are the major weather hazards responsible for flight cancellation in the Airport.

Also the result of flight delays indicates that thunderstorms and fog are significantly responsible for flight delays in the Airport.

The study concludes that there is urgent need for pilots and aviations managers to have knowledge of weather hazards integrated into flight operational guidelines in our airports in Nigeria.

## REFERENCES

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