

UNIVERSITY OF NAIROBI
DEPARTMENT OF METEOROLOGY

**THE ROLE OF BOUNDARY BETWEEN THE EASTERLIES AND
WESTERLIES OF MIDLATITUDE TO RAINFALL PREDICTION OVER
TANZANIA.**

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ABSTRACT

The study has added some new information on the role of the boundary between the southern hemisphere midlatitude westerlies and easterlies in the southern hemisphere in relation to rainfall predictivity in Tanzania.

From the observations there are indications that the boundary between the winds of easterlies and westerlies that is zero line of the mid latitudes may have influence on the rainfall performance during dry and wet conditions. The main objective of this study was to investigate the influence of the boundary between south easterlies and westerlies on rainfall over Tanzania. Data used in the study was from stations which are in southern Tanzania Mbeya, Iringa, Songea and Mtwara. In central were Tabora, Dodoma, Kigoma and DIA, Northern were Mwanza, Musoma, Arusha and Same for the period from 1961-2014.

And also included data sets from NCEP/CPC reanalysis winds system for rainfall.

Arithmetic mean and single mass curve methods were used in data quality control check. Other methods of analysis included time series analysis. The results from the data quality control showed that the data were consistent and therefore good to be used. The rainfall data for all stations were subjected to time series analysis to show the general trend of rainfall over the years. Therefore I was able to identify dry and wet years during the seasons March-April-May (MAM) and October November December (OND). Using the grads software for wind analysis at 700mb level, the zonal wind (u) and meridional wind (v) components were easily analyzed to link and associate the patterns with dry and wet conditions in the country. Results from the circulations of winds during MAM and OND were averaged to obtain the mean circulation which was compared to circulation during dry and wet years.

Various positions of the boundary have been located interestingly the result shows that during OND season, the boundary tends to move northwards and brings wet conditions in both regions of Tanzania the shift being around 3-5° from the mean circulation.

Similar situation has been shown during MAM but only for the Northern Tanzania whereby we have seen the boundary has shifted northwards to 12°S and bring wet conditions. While the Central and Southern showed opposite results.