

**APPLICATION OF THE MARKOVIAN MODEL FOR
INVESTIGATING THE SEQUENCES OF LATE, NORMAL
AND EARLY ONSET AND CESSATION OF THE RAINS IN
NIGERIA.**

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ABSTRACT

Rainfall and potential evapotranspiration data spanning 59 years (1940 –1998) were analyzed for 4 major ecological zones of Nigeria to determine the onset and cessation of the rains which were categorized into late, normal and early. The Markov chain model was then used to investigate the pattern of sequences of late, normal and early onset and cessation of the rains at selected stations in each ecological region. The transition probabilities of these events showed that the probability of persistence of early onset was highest and this was followed by late and normal respectively. However, iterations of the transition probabilities produced a steady state transition probability which showed that persistence of late onset of the rains was higher than normal and early. The pattern of late onset of the rains looked anomalous as it appeared not to conform to the basic inter-Tropical Discontinuity (ITD) model of rainfall incidence in Nigeria thereby indicating that other factors other than ITD model control alone hand the pattern of occurrence of sequences of the cessation of the rains reflects the dominance of ITD control. Furthermore, the characteristics of the cessation of the rains (late, normal and early) converged to a steady state earlier than those of the onset indicating that the observed in this study that there is a high probability of occurrence of late onset and early cessation of the rains. Thus each ecological region faces the risk of incidence of shortfalls in the duration of the alleviating or avoiding possible adverse effects on crop yield have been suggested.

Keywords: Onset, Cessation, Rain, Markovian model, Nigeria.