

Seasonal and Temporal Rainfall Variability in the Intermediate Zone of Sri Lanka during 1941-1970 and 1971-2000

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Sri Lanka, being a tropical country, is characterized by rainfall which has many faces; heavy, torrential intensity during a short time, striking seasonality and great inter-annual variability. Before 1960s Sri Lanka had been divided into two main climatic zones based on the annual rainfall as Wet Zone (WZ) and Dry Zone (DZ). By mid 1960s it was understood that this demarcation itself does not provide a precise classification and another zone was introduced as an Intermediate Zone (IZ) which reflects a combination of characteristics of both the Dry zone and the Wet zone (Punyawardhana, 2000). The annual average rainfall of these regions, WZ, IZ and DZ varies as >2500mm, 1750-2500mm, <1750mm respectively.

This work attempts to capture the temporal and seasonal variability of rainfall in the IZ where cultivation of a variety of economic crops, such as paddy, tea, coconut and spices are taking place. An inter-comparison between the two periods of interest is also carried out alongside studying the seasonal variations. Further this work aims to identify rainfall anomaly events focusing on inter-annual variability.

The fundamental rainfall seasons, Northeast Monsoon (NEM; May to September), Southwest Monsoon (SWM; December to February), First Inter-monsoon (FIM; March to April) and Second Inter-monsoon (SIM; October to November) were considered to identify the seasonal variability of rainfall in the IZ based on monthly mean rainfall. The seasonal variability of main monsoons (NEM and SWM) and inter-monsoons was compared separately for the two periods of interest, 1941-1970 and 1971-2000. Further the inter-annual variability of rainfall was also considered by focusing on rainfall anomalies in the two periods. In all cases monthly average rainfall figures for the periods considered were used and these were taken by averaging values across nine stations in the IZ.

When considering the seasonal variability of FIM and SIM, it clearly shows that the rainfall is less in both seasons for the period of 1971 to 2000 as compared to the period of 1941-1970. But the amount of rainfall in both periods is higher during the SIM. The SWM and the NEM seasons also show the same characteristic with regard to variability with an exception in the SWM, where in May the average rainfall for the period of 1971-2000 exceeds that of 1941-1970. Further the SWM shows a decreasing trend followed by an increasing trend within the season while NEM is only associated with a decreasing trend. The anomalies obtained for the period of 1941-2000 further confirm the overall deficit of rainfall within the period 1971-2000. From 1971-2000 it

was found that only 9 events (years) were associated with positive anomalies out of 30 events (years) but 21 out of 30 events were so for the period 1941-1970.

It can be concluded that the seasonal and temporal variability of the IZ are playing a significant role in the rainfall climatology of Sri Lanka and also the deficit of rainfall found in the second half (1971-2000) further provides a clue that the island would also to be vulnerable to climate variability and/or to so called climate change which can be further confirmed using a tool like climate modeling.

Keywords: variability, seasonality, NEM, SWM, inter-monsoon