

M.S.99 RAJAN, C.K.—Studies on some characteristics of Indian Rainfall—1988—Dr. R. Anantha Krishnan and Dr. K.G. Nair.

The study has shown near normal distribution of rainfall series at most Indian stations during the annual/southwest monsoon season. The association between cumulated percentage rain amount (x) and cumulated percentage number of years (y) can be presented empirically by an equation, $X = y \exp (y-100)b$ involving only one constant for stations having large amounts of annual/seasonal rainfall and small values of co-efficient of variation (C.V.). Similarly, stations with smaller rainfall and higher C.V. values can be represented by an equation, $x=ay \exp by c$, with three empirical constants.

When monthly rainfall is considered, a single normalised curve gives a reasonably good representation of the association between x and y , applicable for long period rainfall data of all Indian stations. This curve can be used as a useful tool to draw conclusions of hydrological interest at any place.

During southwest monsoon season, stations in the Arabian Sea Islands and on west coast of Indian receive their maximum rain amount during early morning/late

night hours and minimum during noon. For interior stations, the corresponding periods are evening and morning hours respectively. During pre-monsoon season, coastal and inland stations receive their maximum during evening/night hours and minimum during noon hours. Retreating monsoon season shows maximum rain in evening hours in west coast stations, forenoon hours in island stations and early morning hours at east coast stations. Minimum is received by west coast stations during noon, island stations around evening and inland east coast stations during forenoon.

West coast and island stations show negligible change in diurnal variation of rain intensity during southwest monsoon. Pre and retreating monsoon seasons show significant diurnal variation of rain intensity at all stations.

During southwest monsoon season, stations in the west coast and Arabian Sea islands receive 50% of rain amount in 20 to 25% of the integrated rain duration. The other two seasons show that same percentage of rain amount is received in 12 to 15% of the total duration.

Time of commencement of rain spells shows that during south-west monsoon season, maximum frequency occurs during early morning hours and minimum during noon hours at island and west coast stations. The corresponding periods at the inland and east coast stations are evening and forenoon hours. It has been noticed that during pre-monsoon period, with increasing latitude, there is lag in time of commencement of maximum frequency of spells for the stations from Minicoy to Mangalore. During retreating monsoon, maximum frequency of spells is in evening hours at west coast stations, in forenoon at Minicoy and during early morning hours at inland stations.

70% to 80% of rain spells received at South Indian stations during southwest monsoon, have continued for $\leq 1/2$ hr, providing 20 to 35% of season's rain amount. 8 to 10% continue more than 2 hours, providing 40 to 45% of rain amount. Spells which continue for more than 10 hours can occur one each at Trivandrum and Cochin, 3 at Kozhikode 2 at Mangalore. 85 to 90% of spells have got rain amounts ≤ 1 cm. providing 40 to 50% of season's total. On an average, this season provides a spell each with amounts > 10 cm at Cochin, Kozhikode and Mangalore. During pre-monsoon, 60 to 65% of spells last for $\leq 1/2$ hour, contributing 20 to 25% of season's rain amount. Spells with rain amounts ≤ 1 cm are about 75% at most of the stations.

Studies on minute intensity of rain spells at Cochin show that west coast stations can have very high intensity, a short duration rain independently or embedded within a long duration spell, having intensities greater than 10 cm/hr.

The behaviour and frequency of occurrence of rain squalls show that about 69% of rain squalls during southwest monsoon season occurs in June-July. Almost all rain squalls are accompanied by a freshening of the wind. The direction of wind the time of a rainsquall is northwesterly or westerly.