

ANALYSIS OF RAINFALL DISTRIBUTION IN  
COCONUT GROWING AREAS IN SRI LANKA

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## ABSTRACT

Sri Lanka receives its rainfall due to weather phenomena associated with the Inter Tropical Convergence Zone (ITCZ) and north-east and south-west monsoons. The seasons of rainfall in Sri Lanka have been classified as first inter monsoon (FIM), south-west monsoon (SWM), second inter monsoon (SIM) and north-east monsoon (NEM). The periods corresponding to above monsoons are from March to April, May to September, October to November and December to February, respectively. However some changes in this seasonal pattern of rainfall have been observed over the years. The time of arrival and withdrawal of rains in each season has not been studied during the recent past. The knowledge of onset and withdrawal dates of rains in each season is a key issue for planning many agronomic practices in agriculture particularly in management of tree crop like coconut.

Daily rainfall (1962-1997) of eighteen locations representing four agro-ecological regions of coconut growing areas in Sri Lanka namely low country wet intermediate region (LCWIR), low country dry intermediate region (LCDIR), low country wet region (LCWR) and low country dry region (LCDR) were analyzed to study changes in rainfall pattern during the recent past and the time of onset and length of rain spells using probabilistic models.

There was a significant declining trend ( $P < 0.05$ ) of both, amount of annual rainfall and number of rainy days per year over the last thirty-six years period in most of the locations. In LCWIR, LCWR and LCDIR, where the first peak usually expected during March and April has shifted towards April and May. The first spell of

rain in LCWIR, LCWR and LCDIR has mixed with FIM and SWM rains and it is not possible to separate two types of rains. There was no clear rain spell during March to June in LCDR. The months of January, February, July and August should not be considered into rainy seasons.

It is proposed to classify rainy seasons within a year into three periods irrespective of the region. The three seasons are March to June (extended southwest monsoon - ESWM), September to November (second inter monsoon - SIM) and December (northeast monsoon). The percentage contribution of rainfall of these eight months to annual rainfall varied between 80 - 90%. The SIM rain is more reliable than ESWM rain.

The critical levels of rainfall used to demarcate the agro-ecological regions and its subdivisions have changed during the recent past. Thus, there is an urgent need to redemarcate agro-ecological regions.

The best probabilistic model to explain dates of onset and length of ESWM rain for each location in LCWIR, LCDIR and LCWR is gamma distribution. Identification of suitable time for agronomic practices related to the onset of ESWM rains in the LCWIR and LCDIR should be location specific. A common recommendation can be given for the areas in the LCWR.

The ESWM rain in the LCWIR and LCDIR varies from second to third week of April to mid May and that of in the LCWR varies from first week of April to latter part of May. An early onset of ESWM rains results a proportionally shorter length of rains

while delayed onsets result a longer length. The planning of agronomic practices related to ESWM rain is not recommended in LCDR.

Gamma distribution adequately described the occurrence of SIM for each location. It starts during the first week of October in LCWR and the second to third week of October in other three zones. A calendar for planning agronomic practices during SIM is also proposed for all the locations.

Modeling approach is more powerful than distribution free method in analyzing rainfall data. Results obtained in the present study are very useful and can be used as a guide for planning and implementation of agricultural activities. It is proposed that the present study should be extended for other locations so that more specific recommendations can be given on location basis. Specific recommendations are more beneficial for farmers rather than general recommendation based on agro-ecological regions.