

The Influence of La Nina on Sri Lanka Rainfall

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ABSTRACT

The objective of this study is to identify the relationship between La Niña events and the corresponding rainfall anomalies observed in the 25 districts of Sri Lanka in the last sixty years. Based on Southern Oscillation Index (SOI), district wise rainfall anomalies during the La Niña years for the period of 1951-2011 were investigated by utilizing correlation coefficients and Pearson's level of probability values.

It revealed that the La Niña has a strong influence on the rainfall in Sri Lanka when the La Niña commences in April or May and, prevails for consecutive five or more months with SOI values greater than 8. The seasonal effect of La Niña on rainfall is more pronounced than monthly effect. Negative rainfall anomaly is observed during second inter-monsoon especially in the dry zone. The impact of La Niña in the southwest (SWM) is limited to the wet zone with above normal rainfall. The strongest impact of La Niña is evident during Northeast Monsoon (NEM) with positive rainfall anomaly. These findings may be incorporated in to the process of probabilistic seasonal rainfall forecast

1. Introduction

Sri Lanka is located in the Indian Ocean between latitudes $5^{\circ} 55'N$ to $09^{\circ} 50'N$ and longitude $79^{\circ} 42'E$ and $81^{\circ} 52'E$. The central part of the island is mountainous and the remaining part of the island is practically lowlands. The climate in Sri Lanka can be characterized as tropical and monsoonal and is divided into four seasons. The South West Monsoon (May-Sep) and North East Monsoon (Dec-Feb) are major monsoons that are highly depending on wind pattern. Between those two periods there are another two weather patterns namely First Intermonsoon (March-April) and Second Intermonsoon (Oct-Nov). South West monsoon basically affect for South Western parts of the country and Eastern and North Eastern winds contribute for North East Monsoonal showers and that affects Eastern and North Eastern parts of the country. During the intermonsoon periods, the Island experiences afternoon or evening thundershowers. These two periods affect for entire Island. However the second intermonsoon receives more rainfall comparing with the first intermonsoon. According to the spatial distribution of annual rainfall, Sri Lanka can be divided in to 3 major climatic zones as Wet zone (rainfall $>2500mm$), Dry zone (Rainfall <1750) and Intermediate zone ($2500mm<Rainfall<1750$).

The average rainfall patterns during each monsoon seasons are showed in the figure 1. However the average conditions can be changed due to the prolonged atmospheric phenomenon such as El Nino, La Nina, Indian ipole Index etc.