

The onset, retreat and the length of growing season in the north-eastern region of Sri Lanka

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ABSTRACT: The onset, retreat and the length of growing season in the north-eastern region of Sri Lanka were investigated using daily rainfall data for the period 1961 to 2000. Data from three weather stations situated in the coastal belt in the northern and eastern parts of Sri Lanka (Jaffna, Trincomalee and Batticaloa) that receive rainfall predominantly from the northeast monsoon were selected for this study. A method based on cumulative rainy days was utilized in the determination of the onset and retreat dates. It is shown that there is substantial interannual variability in onset and retreat dates. The mean onset and retreat dates fall on the standard week 38.3 ± 2.7 and 53.0 ± 2.9 , respectively. The mean duration of the growing season is 14.7 ± 3.4 weeks. The retreat date and thus the length of growing season could be extended by 2 weeks if the probability of occurrence of rain during the onset is favourable for the retreat. The results indicate that there has been no significant trend in the onset and retreat dates during the last 40 years in the dry zone of Sri Lanka. The onset date and the length of growing season are weakly correlated with early onset dates leading to longer growing seasons. The study concludes that rainy days could be used successfully to determine the mean rainfall onset and retreat dates in the dry zone of Sri Lanka.

KEY WORDS onset of growing season; retreat of growing season; cumulative rainfall; dry season; wet season

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1. Introduction

Sri Lanka is an island in the Indian Ocean, located off the southern coast of India. The climate of Sri Lanka is considered to be warm and tropical. The mean daily temperature ranges from about 16°C in the highlands situated in the centre of the southern half of the island, to a maximum of 33°C in low-altitude coastal areas. There are predominantly two climatic zones in Sri Lanka, the central and the south-western part of the country, known as the wet zone and the southeast, east and northern parts of the country, known as the dry zone. When considering the wind pattern, the year can be divided into four seasons, namely the two monsoons (southwest monsoon from May to September and northeast monsoon from December to February) and the two inter monsoons. There is high variability of rainfall in different parts of the country during the monsoon seasons. As Sri Lanka's economy depends on agriculture, understanding temporal variation in climate in different parts of the country, especially the variability of intra-monsoonal events such as wet and dry spells as well as the onset and retreat of rainy seasons, is important to enhance agricultural productivity.

The dry zone of the country accounts for about 60% of the total land area in the island, which is mainly low-altitude areas covering a large part of the coastal belt. Although there is high potential for the cultivation of

arable crops in the dry zone because of the fertile soils, lack of rainfall and high evaporation constrain achieving higher yields (Punyawardena and Kulasiri, 1996). In most parts of the country, rainfall follows a bi-annual pattern leading to a main cropping season called Maha (September to March) and a minor cropping season called Yala (April to August). The wet zone receives rainfall throughout the year, which is adequate for year round cultivation. However, in the dry zone, the rainfall is adequate for rainfed cultivation only during the Maha season (Jayawardene *et al.*, 2005). The duration of the growing season in the dry zone is also short and limited to the months from October to January. Thus, in the dry zone, the actual start of a season and the length of the growing season are vital for the rainfed agriculture to obtain favourable results.

A number of methods have been formulated to determine the onset, retreat and length of the growing seasons depending on the time scale and geographical location (Benoit, 1977; Stern and Coe, 1982; Holland, 1986; Sivakumar, 1988; Stewart, 1988). Sivakumar (1988) carried out a study using long-term daily rainfall data of 58 locations in the southern Sahelian and Sudanian climatic zones of West Africa. The study shows that a significant relationship exists between the date of onset of rains and the length of the growing season. By analysing rainfall from 18 countries in Africa, Asia, the Near East and North America, Stewart (1988) has concluded that there is a strong link between the onset and duration of the growing season. However, the study also noted that the link between onset and the amount of rainfall is weak. A recent study carried out in Nigeria (Odekunle, 2006)

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