VARIABILITY OF EXTREME RAINFALL EVENTS IN THE DRY ZONE OF SRI LANKA

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Extreme rainfall events have been a common annihilating phenomenon in present Sri Lanka. These extreme rainfall events result in severe floods, droughts and landslides. Hence, this research focused on the analysis of extreme rainfall events through the use of individual control charts (i-chart), which constitutes a common tool in Statistical Process Control. Monthly rainfall records from 19 weather stations in the dry zone were collected from 1971 to 2017. The data from 1971 to 2000 was considered as base period and used for the Phase I analysis. The period from 2001 to 2017 were considered as the test period and those data were used for Phase II analysis. Chi-square test was used to compare the occurrences of extreme rainfall events between two periods and relative risk (RR) was computed to quantify the results. Chi-square test revealed a significant change ($p < 0.05$) in the occurrence of extreme rainfall events in the dry zone. The greatest changes were observed for December (RR=11.74) and October (RR=11.16). The rest of the months with a significant change in extreme rainfall events were January, March, April, May and August with a relative risk of 2.33, 3.90, 4.28, 4.53, and 5.24, respectively. The station-wise analysis showed significant changes in the occurrence of extremes in *Anuradhapura, Batticaloa, Kanthale* Tank, *Madawachchiya* and *Thissamaharama* compared to the reference period. These findings facilitate decision making and planning related to disaster management and climate sensitive sectors such as agriculture and water resources.

Keywords: Dry zone, Extreme rainfall events, Relative risk, Sri Lanka, Statistical Process Control chart