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**Plain Language Summary:** Sri Lanka frequently experiences extreme rainfalls under the influences of monsoon system and atmospheric disturbances from the Bay of Bengal (BoB) in India Ocean. However, detailed analyses on both the synoptic and mesoscale dynamics in extreme events in Sri Lanka using numerical model are rare. This extreme rainfall event occurred as the cumulative effect of a sustained low-level convergence zone generated by an enhanced westerly monsoon flow and the circulation of the low pressure system (LPS) alongside a continuous supply of high-magnitude moisture, strong vertical motion, and orographic effects of the Central Mountains of Sri Lanka.

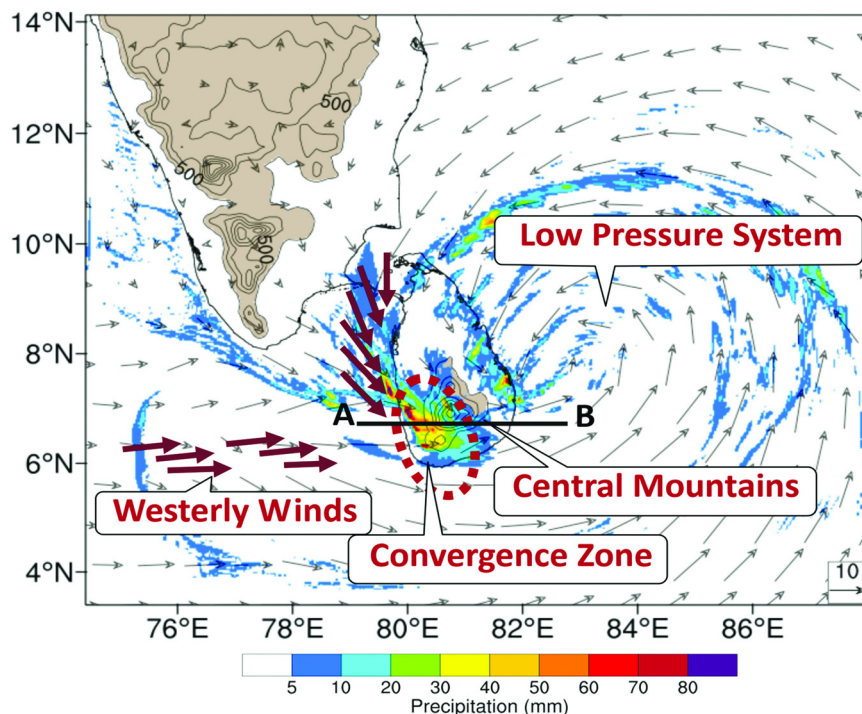


Figure 1. Schematic presentation of the possible mechanism for the observed extreme rainfall in the western coast of Sri Lanka, showing interactions of westerlies and LPS, and effects of central mountains of Sri Lanka. Terrain height contours are drawn every 250 m. Vectors and shading denote the 10 m wind vectors and hourly accumulated rainfall (mm) at 2200 UTC 15 May 2016, respectively.

- This study numerically simulated and examined the mechanism behind the heavy rainfall event that occurred in Sri Lanka from 14–17 May 2016.
- The results indicated that the observed extreme rainfall event over the western part of the island was the result of interactions among the following phenomena: 1). the LPS in the BoB, 2). moisture-rich westerlies from the Indian Ocean and the Arabian Sea, 3) persistent low-level convergence and 4). the orographic effect from the Central Mountains of Sri Lanka.