

P r e f a c e

The thesis is an investigation of some of the physical and dynamical aspects of the summer monsoon over India during two years of contrasting monsoon activity leading to drought and good monsoon years. The chief parameters contributing to the atmospheric energy have been studied, in relation to monsoon activity.

Chapter one is a review of the current knowledge of the Indian southwest (summer) monsoon. It includes the important surface and upper air synoptic features, the distribution of rainfall, heat, moisture and energy balances, with the role of oceans surrounding the Indian sub-continent. It describes the role played by wave disturbances and the linkage between troposphere and stratosphere.

Chapters two to eight deal with the author's original work relating to various aspects of the two summer monsoons during the drought and good monsoon years.

Chapter two gives a brief account of the vertical and spatial structures of the atmospheric parameters like temperature, specific humidity and winds over India.

Chapter three is a study of synoptic features of the two monsoons. It consists of the different aspects of monsoon circulation viz. onset, advance and withdrawal of the monsoons, spatial distribution of rainfall, oscillation of monsoon trough, role of lows/depressions/storms on the monsoon activity.

Chapter four deals with the sea surface temperatures of the oceans surrounding the Indian sub-continent.

Chapter five consists of a study of water vapour flux by zonal and meridional components of winds over India. The vergence of moisture flux with the accompanying contrasts in the two years is studied.

In chapter six total precipitable water and water vapour flux in relation to rainfall over the country are presented.

Chapter seven discusses the energetics of the troposphere and their contrasts in the two years.

Chapter eight is a study of the wave disturbances and the possible linking between troposphere and stratosphere by them.

Chapter nine gives a summary of the salient features obtained and the main conclusions drawn by the author in the course of the present study.

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