

Editors' Page

The editorial committee of VayuMandal invited four distinguished meteorologists such as AVM (Dr.) Ajit Tyagi, Prof. V. BhaskarRao Dodla, Mr. R. C. Bhatia and Prof. P. N. Sen for writing review papers for this issue of VayuMandal. The committee members are very much thankful to these four scientists for devoting their valuable time in writing and submitting their articles on three important topics in the field of weather and climate which are of utmost concern today. The issue of Urban Heat Islands (UHI) in conjunction with the enhancement of Heat Wave Conditions over India are the most discussed topic today. The first two review articles are focused on issues related to monitoring and forecasting of UHI and a brief discussion of heat wave vulnerability for the human health. Urban Heat Island (UHI) is a phenomenon where higher temperatures are observed in several cities as compared to surrounding areas. This review paper dwells on city-specific comprehensive studies to develop appropriate mitigation strategies including city level heat action plans. Necessity of the development of high-resolution UHI monitoring and forecasting capabilities has been highlighted involving different organisations at the national, state and municipality levels. The second review paper on heat waves over India summarises the availability of temperature data over the Indian subcontinent and characterization of heat waves. Both the heat related papers discuss the heat action plans to mitigate UHI and heat wave vulnerability as a part of disaster management. The third review paper is based on 50 years of satellite meteorology. This review article provides a complete historical background of developments of space-based observations in India during the past 50 years and hints at the future prospects including INSAT series. It is highlighted that satellite-based data have emerged as a very powerful tool for applications in day-to-day weather forecasting and atmospheric research. It is stated that a large variety of satellite products have been appropriately used by IMD and other MoES institutions in operations and research work using Numerical Weather Prediction (NWP) models. The fourth review paper discusses fundamental issues related to NWP and highlights its importance in weather forecasting and climate studies. It also discusses various data sources such as conventional instrumental observations, RADAR and satellites. In addition, several types of weather forecasts for various users and forecasting techniques such as persistence, analogue, synoptic, statistical, Neural Network, Artificial Intelligence and Machine Learning and NWP. It infers that with the advancement of observations and computing technologies, the skills of the forecasts have improved considerably and much more can be achieved in future.

The fifth paper in this issue of VayuMandal does an assessment of the relationship of meteorological parameters such as solar radiation, air temperature and relative humidity with the positive cases of COVID-19 at the early stage during March-May 2020 in India. The results show that the temperature relative humidity index (THI) a measure of the thermal stress shows positive correlation with the disease spread. However, much more research work is required based on more data to be collected in future. The sixth paper analyses the role of topography and aerosols in the rainfall over the Western Ghats and rain shadow regions based on aircraft measurements during the Cloud Aerosol Interaction and Precipitation Enhancement Experiment (CAIPEEX-2009). Analysis of the cloud microphysics supports the hypothesis that the shallow convective clouds (i.e., with tops < 6 km) lose their ability to rain over the rain shadow due to increased aerosol concentrations, which are probably attributed to air pollution. The seventh and the last paper in this issue dwells on the global scale features such as Sea Surface Temperature over the equatorial Pacific & Indian Oceans and Madden Julian Oscillation associated with winter weather systems during 2016-17. This season witnessed warmer maximum and minimum temperatures over northern India with above normal and subdued rainfall in January and December & February months respectively. Further, there was above normal snow cover over Northern Hemisphere and Eurasian region.

It is hoped that the first four review papers invited from some of the senior members of IMS and the rest of the three contributed research papers by young scientists will be appreciated by the readers.

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