TECHNICAL SESSION - I

HYDROMETEOROLOGY

General Report
by

Jitendra Lal
Indian Meteorological Department,
New Delhi

Introduction

Research work relating to hydrometeorological aspects of mountainous areas requires investigation both for theoretical and operational purposes. Many of the present theories for estimation of hydrometeorological parameters are mainly impirical. Since the exact physical relation between the parameter used in the equations are not known the accuracy of estimated values in such cases some times become controversial.

Areal and temporal distribution of precipitation, distribution of moisture in the vertical, distribution of temperature in storm field require in-depth study both for diagnostic and prognostic purposes.

Review of papers

In this technical session, abstracts of nine papers have been submitted, amongst which only five are accompanied with full papers.

1 & 2. The first two papers on precipitation gradient and evapotranspiration deal with distribution of moisture in the vertical in mountainous region. The paper on precipitation gradient in mountains of Molnar and Kubjatko has indicated the importance of experimental catchment network in case of precipitation analysis of an accurate assessment of water potential. They have mentioned regarding seasonal characteristics of precipitation gradient. Fig. 3 depicting winter period long term precipitation gradient shows abrupt change at 1400 m a.s.1. This requires proper physical interpretation. The paper on Evapotranspiration by Miklanek shows the importance of this factor in Water Balance studies in special cases. The degrees in evapotranspiration with height as expected has been confirmed by the author by actual computation of these values.

3. The paper on variation of rainfall and temperature by Kothyari and Singh concludes certain climatic change which requires further study. In this connection it may be mentioned that recently in a paper published in MAUSAM (IMD) the authors have already indicated that so far rain is concerned all departures from rainfall are within the usual limits of variation and don't constitute any trend.

4. Sri Ramasastri's paper on Hydromet aspects of September 1988 storm is in some way repetition of similar work done earlier. This storm was examined in detail by IMD scientists in 1988 itself and some of the results including those of 1955 storm were presented in a CBIP seminar held at Bhubaneswar in May, 1989. The author may like to refer to the published proceeding of the seminar.

While describing synoptic system responsible for this rain storm he mentions of "a low pressure over north Gujarat and south Rajasthan on 24th September. In association with this system there was an also an upper air cyclonic circulation extending upto mid tropospheric is a concurrent phenomenon and not an associated phenomenon. The inference on storm intensities requires further confirmation based on data at higher elevation.

5. The paper on convective storm rainfall model by Lopes and Fogal is a statistical approach for rainfall modelling. This is an interesting paper which takes care of majority of the storm parameters in modelling. Later when the author deal on Drought analysis they have used a Drought Index which is a function of both the amount of rainfall and number of events of rainfall in a season. In this process the seasonal temporal distribution of rainfall has been accounted for. This is a very effective way of Drought analysis.. However, the authors may like to reduce the period of the index from a season to shorter period for better results.

6,7,8 & 9. Out of remaining four papers with abstracts alone, two deal with design-storm-depth estimation based on Sept. 88 storm. These studies by Jain and others are operationally useful. The paper of climatic change by Sharma and Padhya indicates that there is no long term trend in the temperature field over the mountains. The authors may like to elaborate on this aspect including those for precipitation etc. The paper by J.K. Sharma and others deal with distribution of lapse rate over a hilly terrain. An interesting point in this paper is the change in the nature of lapse rate at higher altitude which exceed D.A.L.R in almost 50% of the cases.