

MODELLING OF ANNUAL EXTREME RAINFALL USING MLP AND RBF NETWORKS

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ABSTRACT

Assessment of rainfall is of utmost important for planning, design and management of water resources projects such as irrigation and drainage systems, flood protection measures, drought assessment and command area development. As rainfall distribution varies over space and time, the data covering long periods observed at various locations are needed to be analyzed for arriving at reliable information for decision support. Since the ancient methods of astrological and observational are very empirical and unverifiable, the approaches like deterministic, conceptual, stochastic and Artificial Neural Network (ANN) are generally used for rainfall prediction. In this paper, a study on modelling the Annual Extreme Rainfall (AER) of Joshimath and Tohana rain-gauge stations is carried out by applying ANN based Multi Layer Perceptron (MLP) and Radial Basis Function (RBF) networks. The performance of the MLP and RBF networks used in modelling the AER is evaluated by model performance analysis using correlation coefficient, model efficiency and mean absolute percentage error. The paper shows the MLP is better suited network for modelling the AER of Joshimath and RBF network for Tohana.

KEYWORDS: Correlation, Mean Absolute Percentage Error, Model Efficiency, Multi Layer Perceptron, Neural Network, Radial Basis Function, Rainfall